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FOREWORD

Hector MacDonald - President

The Winnipeg Horticultural Society takes pleasure in presenting "The Flower Garden" for 1955. With the wide distribution of this publication over three provinces and its purpose of directing practical horticultural information over this wide area we believe the change in name long overdue.

Rising costs of printing, sales tax and other expenses have made it extremely difficult for us to continue the publication of this book. In 1953 and 1954 we found it necessary to meet a deficit out of the general funds of our Society. However, through the combined efforts of your directors in securing advertising and material, we have been able to produce another outstanding publication. The "Flower Garden" committee under the chairmanship of Mr. Reycraft is to be congratulated.

Sincere thanks to all our contributors. We also wish to thank the firms and individuals who purchased advertising space or donated funds. They are primarily responsible for making this book possible. We recommend their goods and services to our readers.

To our readers, we would like to hear from you. Send us articles, paid advertisements and suggestions. Help us to help you.

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INDEX

Foreword—Hector MacDonald, President	1
Index—Of Material Reading	3
Manitoba Horticultural Societies 1955	4
The Rain Upon the Roof—George Batho	5
The Propagation of Saintpaulias—Mrs. Gloria Codanti	7
A Glance at New Varieties of African Violets—Mrs. C. E. Crooks	9
Evergreens for the Prairies—R. H. Patmore	11
Publications Available	18
4-H Garden Clubs—D. R. Robinson	19
Modern Flower Arrangements—M. O. Robson	21
Portrait—Dauphin Horticultural Society	23
Getting the Most from Christmas Plants	25
Care of Christmas Cactus	26
The "Expert" Gardener—Bruce Hutchison	27
The Art of Propagation—W. Emerson	29
Rose Growing in Western Canada—J. H. Nichol	35
Hardy Chrysanthemums—S. J. Westaway	39
Aster Yellows—Dr. B. Peturson	43
Tips on Growing Paper Whites—W. Emerson	45
Pruning Shrubs—Dr. W. R. Leslie	47
Winter Storage of Bulbs and Tubers—S. J. Westaway	49
Currants and Gooseberries—W. Shelmerdine	51
Some Ornamental Trees—Dr. W. R. Leslie	55
Some Uncommon Plants for the Parkbelt—L. Martinovsky	59
Rural and Urban Home Grounds Competitions Mrs. J. A. McPhee	61
Perennial Patter—Harold Harris	65
Shrub Corner—Hector MacDonald	69
Budding—W. Shelmerdine	71
Care of Evergreens	73
Plant Protectors—V. W. Nuttall	75
Historical Background	79
House Plant Problems	81
Annual Flowers—Dr. W. R. Leslie	83
Wild Flowers	85
Recent Insecticides—A. G. Robinson	87
Horticultural Notes—Hector MacDonald	92
Warning to All Gardeners—G. S. Reycraft	93
Brighten up with Begonias	94
Dahlias—T. E. Babb	95
Rosybloom Crabapples—J. R. Almey	99
The Soil—R. A. Hedlin	101
Potato Varieties—Prof. J. A. Menzies	107
Tastier Meals with Herbs—H. R. Hikida	109
Your Vegetable Garden	114
Gerard's Herbal—M. V. Chestnut	115
Recommended Perennials	119
Annual Flowers	122
Quiz	125
Lawns—G. S. Reycraft	129
Show Dates	131
Index to Advertisers	132

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IN SASKATCHEWAN refer to: D. R. Robinson, Extension Horticulturist, Extension Department, University of Saskatchewan, Saskatoon, Sask.

The Rain Upon the Roof

GEORGE BATHO

When the days are hot and dusty
And the ground is full of cracks;
When the grass looks brown and rusty
And the 'taters and the flax
Seems so wilted and so jaded,
With their heads a-hanging down;
When the scarecrow, e'en seems faded
And the hazel brush turns brown;
Then it's nice to be at midnight,
All so comfy in your bed,
And listen to the rain drops
Pitter, patter overhead.

When the pastures are all eaten
By the 'hoppers and the cows;
And the farmers feel quite beaten,
And are getting out their ploughs
So's to turn down half the barley
'Cause 'tis ruined by the drought,
And the oats, particularly
Seem as though they'd petered out;
Then it freshens all yer bein', —
All yer warp and all your woof —
Just to lie abed, and listen
To the rain upon the roof.

When the ragweed doubles over,
As though hidin' from the heat,
And there's bare spots in the clover,
In the corn and in the wheat;
When you hear the cows a-bawlin'
Till it almost makes you sick, —
For there's not a drop a-crawlin'
'Mongst the pebbles in the creek.
Then it's nice to hear the thunder
An' to see the clouds so black,
While you listen to the patter
On the shingles of yer shack.

When your harvest seems a goner —
(Perhaps you'll mow a bit for feed) —
And it seems as though yer honor
Must be pledged to buy yer seed.
When yer wife's old dress is tearin',
And of thread you've not a spool,
And the duds the kids are wearin'
Are not fit to wear to school;
Then it seems a bit of heaven
To look across the plain
And to hear the steady music
Of a "soaker" of a rain.

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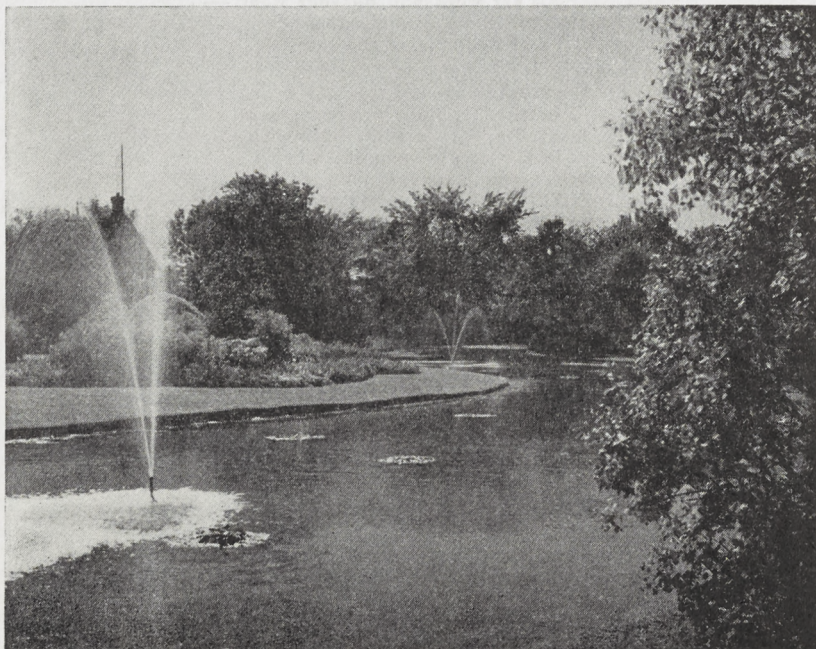
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The Propagation of Saintpaulias

"AFRICAN VIOLETS"

The Saintpaulias, or African Violets as they are commonly called, have found their way into a great many homes. For some people, they grow and bloom profusely; for others they gradually die. Here are a few hints for those folks who love "violets" and yet cannot seem to grow them successfully.

A— SELECTION OF LEAF

1. Choose a medium-size young leaf with a stem about one and a half inches long.
2. To mark name, a ball-point pen is excellent to write (print) name gently on leaf-back.
3. A small glass jar, wax-paper covered, to prevent water evaporation, will hold leaf.
4. Once small roots appear, sprinkle in some vermiculite to practically fill glass. More water may be needed also. This procedure encourages a well developed root system.
5. When "green" shoots appear, leaf is ready to be planted in earth.

B — THE SOIL

1. A suitable mixture contains: one part garden soil, one part coarse sand and / or vermiculite, one part organic matter (leaf-mold and / or peat moss).
2. These components go by measure, never by weight.
3. Soil should be sterilized, if at all possible. Vermiculite is sterile so no further sterilizing is necessary. Peat moss becomes toxic so never sterilize.
4. Other soil components which are beneficial but can be dispensed with are:
 - a. Charcoal — one tablespoon per 3-inch pot.
 - b. Bonemeal — one teaspoon, level, per 3-inch pot.
 - c. Crushed oyster shell — one tablespoon per 3-inch pot, or in bottom of pot for extra drainage.
 - d. Superphosphate — one half pound of 20% per bushel of soil.
 - e. Complete fertilizer — one quarter pound of 5-10-5 content per bushel of soil.

C — STERILIZING SOIL

Sterilizing by steam is recommended as moist heat is more efficient in destroying obnoxious organisms, yet is less destructive to soil structure. Needed are: a large container to hold the water (a roaster is suitable), a wooden rack to hold

the cloth sack, fill loosely with earth above the water, and a tight-fitting lid. After removing from heat spread, cool, mix in other ingredients and let stand two or three days (if possible) to get oxygen back into soil.

Recommended temperature is 180 degrees maintained for 30 minutes ONLY, or ten pounds pressure for ten minutes in a pressure canner.

D — GENERAL CARE OF PLANT

1. Use warmed water, soft water if available.
 2. Top-watering washes down salts back into earth; these salts cause petiole rot when left to accumulate on pot rim.
 3. Bottom-watering encourages a deep root system.
 4. Never allow plant to stand in water after soil is saturated.
 5. Never fertilize dry soil, as roots will be burned.
 6. Dip pot rims in parawax to help prevent salt incrustation and to cover sharp edges.
 7. Sterilize pots if they have been used before.
 8. A 3-inch pot is large enough as these plants do not have large root systems, except when plant is several years old.
 9. Light: never leave plant in direct sun, but give lots of daylight, also artificial light at night, especially in winter, if lots of flowers are desired. Twelve to fourteen hours of light gives best results.
 10. Any direction of light is acceptable if in sufficient quantities. A compact-looking plant is receiving enough light, whereas a spindly plant needs more light, either more daylight by moving plant closer to light source, or artificial light.
- And now, good luck in your next attempt!

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A Glance at the New Varieties of African Violets

MRS. C. E. CROOKS
Winnipeg, Manitoba

Glancing at the new varieties of African Violets is like glancing at a speeding express train. So many varieties are being introduced so rapidly that it is almost impossible to keep up with them. Some are a great improvement over the older ones in size of bloom, color and growing habits and some, regardless of how well they do in controlled conditions of a greenhouse, are a disappointment under average home conditions.

First in Violet excitement come the double pinks. Displayed at the 1954 African Violet Convention, they will be released to the public in the Spring of 1955. There will be around 16 different varieties — possibly more — introduced by the different American greenhouses.

An interesting group are those with green and white mottled foliage: Frosty, a single with variable blue or white blooms; Wintergreen, a double with blue and white blooms; and the newest, Wintry Nite, also a double with dark blue blossoms. Other good new varieties are Star Amethyst, with large "red" five pointed star blooms; White Madonna, pure white double on girl foliage; Double Pansy Beauty, large orchid double, each petal wine tipped; Pink Wonder, very large single bloom, deeper pink eye; All Aglow, single salmon pink, girl foliage; Juliet, double rose pompon, dark shiny foliage; and Snow Line, double "red," each petal banded in white.

For all-around satisfaction, it is still difficult to improve on the older Dark Beauty, Azure Beauty and Double Rose, although it is fun to see the new varieties come in bloom for the first time. Well-grown plants of any of these varieties listed should be a source of pride and joy to their owners.

Hello, Violet Lovers!

Your Winnipeg African Violet Society was formed last May, 1954. We have had one interesting and helpful meeting once a month. We meet the first Wednesday in every month, at the University Building, Broadway, at 8:30 in the evening. Will you let us help you with your Violet problems. If interested call: Mrs. Roy Munt, President. (Phone 40-4791)

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Evergreens for the Prairies

R. H. PATMORE, Brandon, Man.

To dwellers on the prairie area with its long winter season, evergreens assume, possibly, a greater significance than anywhere else. While the bare limbs of deciduous trees etch a symmetry against the frosty sky that has beauty and inspiration all its own, they have submitted to winter's decree. But the evergreens, with tenacious loyalty, defiantly flaunt their summer finery through the fiercest of winter gales.

Western Canada is limited in the variety of evergreens that can be grown. With the doubtful exception of pachystima and Korean box, none of the broadleaf evergreens are at home. However, we have an adequately wide range of conifers that are well adapted, and the most important of these is the genus *picea* (spruce), a family or genera that is too well known to need description. The most familiar species of this family is our native or so-called white spruce (*picea glauca*). It is quite conical in shape with rather soft, medium long, green needles, sometimes carrying a faintly bluish tinge.

A sub-species, Black Hill Spruce (*p. glauca densata*), has developed in the comparative isolation of the Black Hills of South Dakota and usually produces a larger proportion of well-shaped trees than the species. Black spruce (*p. mariana*), deeper green in colour, with shorter and stiffer needles, is found in the northern and eastern prairie forests. Norway spruce (*p. abies*) is rather similar in appearance to the native. Its native range is in northern Europe and has proved adaptable, particularly in some of its selections such as *nidiformis* or nest spruce. Possibly the most important of the spruce, from an ornamental point of view, is the Colorado spruce (*p. pungens*), important because of the valuable selections made from it. The intense silvery blue Morden and Koster's, and the dwarf, blue R.H. Montgomery are clonal selections of Colorado.

The word clon, incidentally, introduces a concept that is of considerable importance to the plant grower and user of ornamentals. Variation is a conspicuous characteristic of all forms of life. Taking an example from the plant world, if a thousand seedlings are grown from seed gathered from one blue spruce, not two of the thousand will be exactly alike. Most will be green; some will be greyish green, and a small percentage bluish, with only a very small percentage, possibly not more than twenty-five trees, intensely blue. And all of these will vary in form. Some will have short needles; others will be open and thin in appearance; some will be squat and unshapely. If ten trees of the thousand approximate the parent

in form and colour, this could be considered a satisfactory result.

To obtain trees that will be exactly like the parent it is necessary to propagate them vegetatively, that is from cuttings or slips, or by grafting. A selected tree that is propagated in this manner is called a clone. It is found in practice that the great majority of trees grown from seed are inferior as ornamentals and it is necessary to cull out most of them when they are large enough to indicate their form. This, of course, doubles the cost. Even with white spruce, black spruce, the pines, firs and larches, etc., it is found that only in vegetatively propagated selections of the best can satisfactory specimens be obtained. In the case of most evergreens, this means grafting, since only cedar and some juniper will root satisfactorily from cuttings.

The pine is a long-needed evergreen, the needles varying in length with the different species. The Finnish strain of Scotch pine (*pinus sylvestris*) has proved most satisfactory. The southern alpine strains usually are softer and more attractive in appearance, but selections of the Finnish strain now being grafted are equally attractive and much hardier. Swiss stone pine (*p. cembra*) is probably the most ornamental of the pines. It has long needles, three inches and more in length, with a soft appearance. It is quite slow-growing and for many purposes can be considered dwarf.

White pine (*p. strobus*) selected from strains native to the Dryden area, is hardy. It, like *cembra*, is a five-needle pine; that is, the needles are produced in bundles of five held together at the base by a sheath. The needles are finer and softer than *cembra*, and the tree grows more rapidly. Norway pine (*p. resinosa*) and lodgepole pine (*p. contorta latifolia*) are useful. Two Dwarf Scotch pine (*p. sylvestris wateri* and *nana*) are very attractive dwarfs which are difficult to distinguish from one another. They can be grown conical or globe-shaped. Pyramidal Scotch pine (*p. sylvestris fastigiata*) is strikingly columnar, rarely exceeding 2½ feet in width and reaching up to 20 feet or more. These latter varieties have shown occasional sunscald in experimental plantings but may be less susceptible as they become more deeply rooted.

There are several specimens of dwarf mountain pine of which *p. mugo mughus*, a medium dwarf reaching 6 to 8 feet or more high, is commonly used. *Pinus mugho pumilo*, a low dwarf rarely exceeding 4 feet, is less common. These can be sheared to make them more regular in form, more compact, and, where desired, to keep them low. Shearing will be discussed later. *P. mugo compacta*, a selection of *p. mugo rotundata*, appears to have gone out of cultivation but some excellent selections of *mughus* and *pumilio* have been made for vegetative propagation.

The fir family has few members hardy on the prairies. Balsam fir (*Abies balsamea*) is the only native. Alpine fir (*A. lasiocarpa*) seems adapted. Douglas fir (*Pseudotsuga taxifolia*) is not a member of the genus *Abies*. It is hardy when selected from its northern range in Alberta or British Columbia. Very few Douglas fir from seed are well enough formed for ornamental purposes, and a graft from a selected specimen is almost essential.

Balsam fir suffers from undeserved neglect. As a young tree it is very attractive and good specimens which can be propagated by grafting hold their form well into maturity. Only rigorously selected specimens or grafts should be used. Balsam produces the best Christmas tree of any. Its foliage is a deep glossy green; the branching is rigid and slightly upright. It does not lose its needles in the house and when freshly cut has a pleasing, pine-forest fragrance. Moreover, it has the traditional Christmas tree form with medium-long needles, free from the ragged appearance and yellowish colour of the pine.

A conifer that is not evergreen, the larch, deserves wider use. In October its foliage is brilliantly golden. Siberian larch (*Larix sibirica*) probably is the most suitable for the prairies and a selected form made at the Sutherland Experimental Station, now being grafted, possibly is the best for conspicuous situations. It is compact, heavily foliated, with long, silky needles, and is not so fast-growing as larch from seed.

Thuja, more frequently called cedar or arbor vitae, and juniper form a group of rather borderline adaptability, but of very great value in landscape use. Lower-growing forms of these species are particularly valuable for use with modern ranch-style homes. Pyramidal cedar is possibly the most spectacular of this group. It is very densely foliated, quite columnar in form, and stands trimming well. It is a deep rich green colour and contrasts well with white stucco or light-coloured walls. Another excellent variety is Ware's cedar (*T. wareana*), sometimes called Siberian cedar because of its ruggedness. It also is very thickly foliated and can be sheared into either columnar or globe forms. Neither develop into tall trees and both can be kept as low as desired by trimming.

A globe-shaped variety (*T. compacta*) is a true dwarf, not exceeding four or five feet at maturity. Like all dwarfs it is very slow growing. *Thuja* are shallow-rooted and require considerable moisture for good results, but do not do well in soggy, undrained soils. They should always be watered consistently in dry weather. Their dense foliage, which makes them so attractive, results in a greater moisture loss through the foliage than is usual in less heavily foliated trees.

This transpiration, as it is called, is stimulated by warm, bright sunlight and the movement of air about them. In sum-

mer they can always obtain sufficient moisture from the soil to offset this loss, but when roots are in frozen soil, loss of moisture can be greater than the roots are able to compensate for and the result is sunscald. This shows up in spring after frost is out of the foliage by a whitening or browning of foliage. If moderate the tree usually outgrows it by mid-summer, especially if kept well watered. If excessive the tree will be killed back to below where scalding has taken place. Strong winter winds and exposure to the afternoon sun in late winter stimulate transpiration, therefore a location sheltered from west and north winds and shaded from the afternoon sun is desirable. Usually they will stand full use, however, if well sheltered from winds.

Wrapping is not a preventive because it shuts off air and is more harmful than sun or wind. Prevailing winter winds are from the north and west and these exposures are not good unless the tree is so close to the house that their roots are in unfrozen soil near the basement. Air currents also are less active near a house. We have thousands of these growing in the open at Brandon with no protection, and they never suffer more than a moderate sunscald, and then only in unfavourable winters.

Junipers have proved quite successful and selections of juniper scopulorum from the badlands of Montana and North Dakota seem most adapted. They are quite resistant to drought and stand exposure to the sun. We have found that they will suffer winter sunscald when young if exposed to winter winds and they should be in a well-sheltered location or close to a house. As they grow older and the roots get well into the sub-soil they seem to resist sunscald quite well.

Some selections are columnar such as Grizzly Bear, and a new unnamed selection. Grizzly Bear is greyish with silvery tips, as the name implies, and the new selection is quite blue. Silver globe is an intense silvery blue, forming a globe or mound shape up to 6 or 7 feet high. It is better if kept pruned into a compact form. Minima is a true dwarf, dense and low-growing. Selections of *j. virginiana* have survived. One such is Canaert's juniper and we have seen some of the blue forms apparently quite at home. Junipers sometimes are troubled with rust when growing near apples or hawthorn. However, we have found this to have no adverse effect if the tree is examined in the spring and the small, hard, woody galls or the star-shaped gelatinous "cedar apple" are removed and destroyed.

All evergreens when small are susceptible to injury from dogs; cedar and juniper are particularly susceptible. If the lot is not fenced, low flower bed fencing should be around each tree, at least 10 inches from its outside spread, since if closer

it is no protection. The trees are more conspicuous in winter, damage is more likely then and wire should be raised if the snow is deep. Even if dogs are not kept on the premises or nearby, strays are sure to get at them.

One mistake often made in planting the larger evergreens such as spruce, pine, etc., is to overdo it. A row of spruce along the front of a property rarely adds to its attractiveness, unless they consist of something particularly choice such as blue spruce, well spaced out, and even then only when the property is wide and the house set well back. They should not be closer than 25 feet in such a planting. There may be good reasons also for placing a row along a side but it is easy to give a small lot a buried appearance by such planting. Grouping of two or three of a variety towards the corners of larger properties usually is more effective, also in the curves of paths or driveways. On small properties one tree in such locations may be sufficient. One, or at the most two, might be placed at the corners of the house, diagonally out from it, and well away from it.

Since so few of the large evergreens can be used with effect on an average city lot, they should consist only of the best selected or grafted specimens. Greater use, however, can be made of the smaller evergreens such as cedar and juniper, and they are more desirable for planting close to the house. Cedar and juniper are frequently used in foundation planting, the taller varieties at the corners and accent points, and lower forms such as juniper *sabina* under windows. A foundation planting should not cover every foot of foundation, as if there were something indecent about an exposed foundation line. If taller evergreens are desired close to a house they should be kept rigorously pruned to a low form. Dwarfs, such as the dwarf blue spruce now being propagated, will make this unnecessary. A low ground cover is often desirable at the top of a terrace or exposed high point. The blue horizontal juniper is very effective for this purpose. *Pachystima* also is excellent, but strains available have shown a tendency to sunscald. A new strain said to be sunburnproof is now under propagation.

Perhaps a word of caution should be added about trees obtained from the bush. It is possible to find a good tree in the bush but no one ever does. All that has been said about variation in form and the large percentage of culls applies to bush trees. Trees taken from the bush usually are those most readily available, and the planter is fortunate if most of them fail to grow. They will be eyesores as long as they live and ultimately will have to be removed because of their unsightly form, an expensive procedure when trees become large. If you must go to the bush, take time to find a compact, well-formed tree. Your grounds will be more attractive without the other kind.

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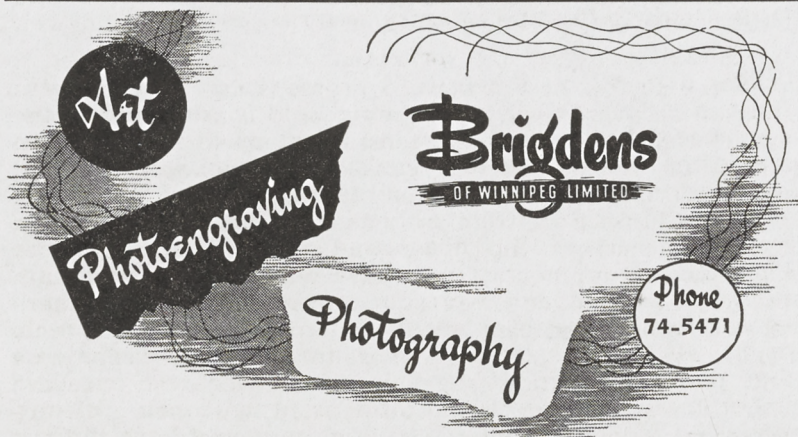
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Pruning and shearing of evergreens must be more carefully done than in the case of deciduous trees. Selected or grafted trees require little or none, unless it is desired to keep them low, or to a form not natural to them. Otherwise, they might require an occasional cutting back of a shoot that is developing so as to interfere with tree symmetry, or the cutting back of a leader or terminal shoot which might grow too long in one year if growing conditions are good, tending to give the tree a thin appearance. Spruce fir and larch can be pruned in the fall or in early spring. The cut must be made in new growth only, and just above a well-developed bud. Such buds do not occur on growth more than one year old and a cut in such wood will cause it to die back. **Pine can be pruned only in mid-June** and then only in the new soft growth. They will form new buds around the cut. Since they do not form buds along new growth like spruce, the cut branch will wither and die if cut at any other time of the year. After mid-June the tissue seems to lose the capacity to form new buds.

Shearing of pine and spruce has often been practised to develop a good form in naturally poor-shaped trees. This will result in a fine-shaped tree as long as it is continued. However, when the tree gets into the hands of the home owner he is often unaware of the necessity of pruning and in any case the tree soon becomes too large to prune and assumes its original undesirable form. An example can be seen of this in a large garden in Manitoba. Large groupings of evergreens, Black Hill spruce in this case, were planted some years ago and when planted they were quite impressive with compact regular forms. They are now about fifteen feet or more in height; all have reverted to their natural form and a very large percentage are thin and poor in appearance, excellent timber trees but very undesirable as ornamentals. Selected or grafted trees costing very little more would have given a far more satisfactory result. Those who prefer good trees would dig such trees out and replace them. It means the loss, not only of the tree, which involves only a few dollars, but what is more important, ten or fifteen years, finding out what they are like.

Cedar and juniper can be pruned or sheared almost as one desires, and it is done in the summer during the active growing season.

Evergreens grow very slowly when small. Roots are grown three or four years before grafting, and it then takes about ten years to bring them to saleable size. However, by that time they have established an adequate root system, have reached a height of from 15 to 18 inches and they begin to grow rapidly. Within three or four years of transplanting, such trees make an effective contribution to the appearance of the grounds.

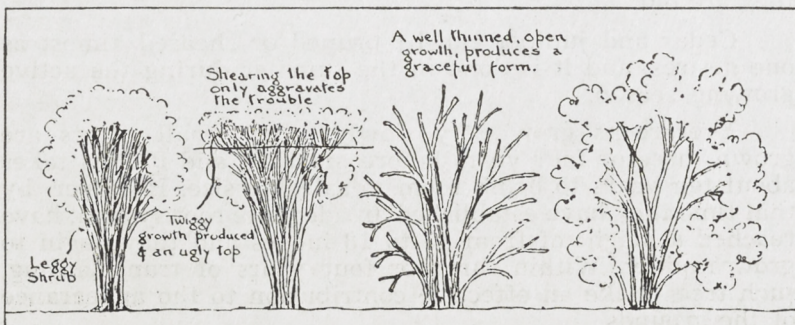
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4-H Garden Clubs

D. R. ROBINSON

Extension Horticulturist, University of Saskatchewan

Almost everyone in rural Saskatchewan is familiar with the 4-H Grain, Homecraft, and Livestock Clubs for boys and girls. Only during the past three or four years, however, have 4-H Garden Clubs attracted any attention in this province. In 1954 there were 37 garden clubs in Saskatchewan with a total of 727 members. This membership was divided fairly evenly between the boys and the girls. It is probable that there will be a substantial increase in the number of garden clubs during the coming year. Briefly each club member plants and cares for a plot of at least 400 square feet and including seven different kinds of vegetables. (Next year, annual flowers will be included along with the vegetables.) Records are kept of the dates of planting, varieties grown, and time of harvesting. Then in early autumn each club holds an Achievement Day. Here they receive training and practical experience in the preparation and judging of exhibits. The 4-H Club motto is "Learn to Do by Doing".

Our most southerly garden club is at Hoffer in township two, and the most northerly, at Buffalo Narrows, just south of the 56th parallel or approximately 460 miles north of the international boundary. The 4-H Agricultural Clubs in this province are supervised by Mr. H. Clark, of the University Extension Department. Valuable assistance in club work is provided, however, by the Agricultural Representative Service. In connection with the garden clubs, and more particularly those in the north country, special recognition must be given to the work done by Don Neilson, Agricultural Representative for that area. He has organized successful garden clubs at Cumberland House, Montreal Lake, Molanosa, Snake Lake, Ile a la Crosse, Beauval and Buffalo Narrows. Certain of these clubs include a number of Metis and Indian children. In addition, garden competitions for adults are held every summer in some of the above mentioned communities. It is hoped that through the garden clubs and garden competitions the nutritional standards of the people in these northern areas may be improved.

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Modern Flower Arrangements

M. O. ROBSON, Dauphin, Manitoba

I would like to tell you briefly something of the development of the Art of Flower Arranging.

Hybridizers have worked diligently and with success to give us many hardy varieties of flowers which could not be grown successfully on the prairie twenty years ago. With the wider choice of material made available to us by these new varieties and the work and influence of horticultural societies and garden clubs, prairie people have become more flower-conscious and are anxious to know the most attractive way to use the flowers they grow or buy. Many women now are using some of their leisure hours to study various arts and the one of flower arranging has come in for its share of attention. One of the things most apparent in the study of arranging is that of the two separate and very definite ideas of the art in the past, mass and line.

Ornate bowls filled with masses of gorgeous flowers, with almost a complete disregard of line or flowing graceful rhythm, have been used by British and European people for centuries. These colourful bowls of flowers were a favorite subject of Flemish painters and a great many paintings of them have been put on canvas, portraying the beauty of the mass arrangements of past centuries.

The other idea is the Oriental art of arranging with emphasis on line. The basis motif of all Oriental arrangements is Heaven, man and earth. Heaven is represented by the highest point in the triangle, earth by the lowest point, with man suspended between the two. This is the basis of all triangular arrangements.

The Chinese developed this art centuries ago and taught it to the Japanese who did very clever things with it. This art is taught in Japanese schools today and perhaps is the reason why it has become known as a Japanese art. Their arrangements are often symbolical and seasonal and may be no more than the grouping of graceful curving branches, which are green and flowering to represent Spring and youth, or bare and leafless to represent the stark trees of a Winter landscape of old age.

We of this continent have combined the two ideas of mass and line and the combination has proved to be a most interest-

ing one, producing beautiful compositions known as modern flower arrangements.

First of all, we choose a definite line or design for the composition of the pattern we wish to follow. It may be a rectangular, triangular, semi-circular or some other shape. This line is the visual path following the main outline of the design we decide to use. When we have established the definite line in our composition we will fill in or build it up, rather sparingly, with masses of flowers in harmonizing colours or pleasing contrast. The whole arrangement must have balance or a look which gives a feeling of stability as if it were growing. Balance is often achieved by the proper proportion of colour and suitability of container to flowers. In this way we balance the bottom of the arrangement in relation to the top.

Balance may be achieved too by making everything symmetrical, that is, an equal size on both sides. A symmetrical balance comes from balancing larger, lighter flowers with heavy, shiny foliage and tight clusters of flowers to give an appearance of equal weight.

The arrangement must have rhythm which gives a suggestion of movement or motion and is most often achieved by the arranging of material in flowing curves or sharp angles. It must have also harmony, which is simply good relationship between all materials used, and unity, which blends the whole into one pleasing composition. It must have a focal point or centre of interest. This is where the visual lines converge and usually is near or at the rim of the container; here the largest or darkest flowers are grouped or the strongest foliage or contrasting colour.

So, using strong lines, massing flowers of pleasing colour combinations rather sparingly with rhythm, harmony and a centre of interest, and balancing the whole composition by proper proportions, we achieve a modern arrangement with which we may use suitable figurines, statuettes or other ornaments as accessories.

I would like to mention the use of wood, particularly driftwood, in modern arrangements. Wood is becoming an increasingly popular material and can be used to carry out or even emphasize the clear-cut dramatic lines of this modern art of flower arrangement. Wood may be combined with pieces of rock, cut green foliage and small animal figures to make bold, simple landscape scenes with the wood as the dominant feature. The foliage should never distract the eye from the line of the wood.

Gnarled pieces of wood or roots, or often a piece of bark, can be used as a container for plants or dried flowers.

Driftwood can be used to enhance a dish garden, or larger pieces may be used in a more elaborate arrangement of an entire window garden.

Particular attention should be paid to scale when using driftwood in an arrangement. Choose your materials very carefully keeping in mind their relationship to one another and in this way achieve scale and harmony.

Wood, though an everyday material, can make your arrangements as modern as today's new homes.

“PORTRAIT”

This is a portrait of Mrs. F. W. Robson, a busy farmer's wife, or perhaps it should be a farmer's busy wife.

As well as raising five children, two of them still in school “Mary” is an avid gardener. The proficiency of her endeavors has been rewarded by winning the Dauphin Rural Grounds Competition and receiving honorable mention in Provincial competition.

Not only is Mary a heavy competitor in the horticultural show at Dauphin, she also attends shows and fairs in the surrounding district judging and giving demonstrations on preparing fruits and vegetables for show, and on flower arrangement.

Mary, too, is a member of the Old Dauphin Ladies' Club which holds its own Flower Show each year. She is a Director of the Manitoba Horticultural Association and has just completed four years as Secretary-Treasurer of the Dauphin Horticultural Society and one year as their Secretary.

Mary has just laid aside office for a well-deserved rest. Much can be said for the work she has done to promote horticulture in Dauphin and District. Her efforts as a director for 1955 will be a continuing asset to our Society.

In gratitude,

1955 Board of Directors,

Dauphin Horticultural Society

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Getting the Most From Christmas Plants

There is such a radical change in growing conditions when a Christmas gift plant is brought from the florist's to an average home that, unless you take the same pains, it is very difficult to keep it in good condition much after the New Year. With care, however, the life of these plants can be extended for several weeks beyond the holidays.

Follow these tips for preserving your Christmas plants:

Cyclamen: Keep the plant in the coolest part of the home with a temperature of not over 60° at night. Use plenty of water during the period and never allow it to wilt. An even more desirable temperature for the cyclamen is a range of from 40 to 50° such as you might have in an enclosed porch.

Poinsettias: These require a warm and even temperature. Keep poinsettias well supplied with water but not continually soaked. Changes in temperatures, drafts or dryness will result in loss of foliage almost immediately. After the leaves fade, set the plants in the cellar until spring — when they can be cut back to 4 inches and set out in the garden. Although they will not bloom in the garden, they do produce attractive foliage and are a kind of curiosity.

Azaleas: The cooler they are kept in the home, the longer they last. They should have good light and plenty of water.

Jerusalem Cherries: Keep fairly cool, water moderately and set them in a window where they receive all sunlight possible.

Begonia: Prefers moist atmosphere, moderate watering and some sunlight each day.

Cineraria: Requires abundance of water with a cool, humid atmosphere.

Calceolaria: These exotic plants are very short-lived under average home conditions. Keep them as cool as possible, on the dry side, and give them plenty of light.

TO PREVENT RUST ON GARDEN TOOLS

Dissolve 2 oz. of paraffin in a pint of carbon tetrachloride. This mixture will leave a protective waxy film which does not attract dust and grime as does oil or grease.

Care of the Christmas Cactus

The Christmas cactus (*Zygocactus truncatus*) is an old fashioned house plant dear to the heart of many a window gardener. This plant originated in Brazil and has been in cultivation over 100 years. Being a tropical plant, it requires a richer soil than the desert cactus.

Another definite requirement for successful growing of the Christmas cactus is good drainage. The soil must not be too heavy. A good mixture is 2 parts loam, 1 part leaf mold or peat moss, 1 part sand and the addition of complete plant food at the rate of 1 tablespoonful for each gallon of soil mixture. Small pebbles or gravel should be placed in the bottom of the pot to facilitate drainage.

For generous bloom, work complete plant food into the soil around the plant every 4 to 5 weeks when growth is active. Many window-sill gardeners prefer to feed complete plant food in tablet form. In this case follow the manufacturer's directions.

A sunny location, preferably a south window, is best for this plant. Temperature should range from 60 to 70 degrees Fahrenheit.

Water sparingly, except when in bloom. Excessive watering and poor drainage causes dropping of the flowering buds. After the plants finish blooming, withhold water and allow the plant a rest period.

It is not necessary to repot Christmas cactus as often as some other house plants. It may be kept in the same pot several years.

The chief enemy of the Christmas cactus is the mealy bug. The fleshy leaves should be wiped carefully to remove dust and lessen the possibility of mealy bug infestation. When mealy bugs appear, touch them with a bit of cotton dipped in alcohol.

MAN DOES NOT LIVE BY BREAD ALONE!

Who says we're materialistic? Americans spend as much for African violets as apple trees! They spend more for rose-bushes than for all the trees and vines set out in vineyards, orchards, citrus and nut groves. And they spend more for evergreens than they do for roses.

The "Expert" Gardener

BRUCE HUTCHISON

The Listener, of London, printed a solemn article on the manufacture of garden compost — too solemn. That is the trouble with all amateur gardening nowadays. It is becoming so solemn, expert and complicated that soon no ordinary man will dare to garden at all. He will take up some simple pursuit like medicine, economics or atomic fission.

As an aged gardener I am growing weary with too much advice of this sort. When I was young a man planted a tree or a cabbage, trusted to nature and reaped his crop in due season. When he sowed a row of radishes, he didn't need a text book in his hands or a professor looking over his shoulder. Today gardening, which once was a carefree hobby, has become a science. The scientists, who once were mere gardeners like the rest of us, have all become consultants, oracles and writers, their hands, once rough with honest toil, now smooth and plump from the touch of a pen. Not long hence they will be psychoanalyzing brussels sprouts.

A SECRET

At the risk of breaking a trade secret, I venture to reveal the fact that compost is just a pile of vegetable refuse in a healthy state of decay. It is rot, that's all, like most of the stuff written about it. You don't need the Listener and the British Broadcasting Corporation to tell you how to make a compost pile.

In fact, no human being can make a compost pile. Only the bacteria can make it and they never broadcast or write in the magazines. They are too busy with their honourable labours.

The bacteria, with small help from me, have made hundreds of compost piles around here. None of them was scientific. All of them would have scandalized the experts. But they made everything grow and that, curiously enough, was their purpose.

If one followed the advice of such writers there would be no gardens. They usually begin by instructing the man who has acquired a piece of land and desires only its innocent enjoyment to dig it two or even three spades deep, as if anybody had time or energy for that. Then he may leave it fallow for a year or two, or cover-crop it, and finally enrich it with six inches of good rotted barnyard manure.

As if anyone could find barnyard manure any more, as if this precious stuff (supposing you find a morsel of it), is

ever allowed time to rot before all the hungry gardeners in the neighbourhood seize upon it.

This is only the beginning. Having exhausted himself and permanently injured his spine by the preliminary labours, the gardener must then become a chemist, must analyze the soil, test its chemistry and prescribe remedies, plying it with nauseous chemicals, the blood and bones of animals and the processed carcasses of fish.

Or take the simple business of planting a tree, surely one of the most satisfactory, permanent and noble things that any man can do in his lifetime. Every man likes to plant a tree because he knows it will grow, flourish and shade his descendants long after he has departed. But few men will dare to plant a tree if they read the experts' instructions. The job is too formidable, the risk too great, the result too uncertain.

"Dig," says the expert writer, "a hole six feet square to a depth of five feet and fill it to a level within 17 inches of the surface with a mixture of leaf-mould, well-rotted manure, ten per cent peat moss, six per cent bone meal, three per cent animal blood, together with nitrogen, ammonia and other chemicals in proportion to the chemistry of the adjoining soil.

"These proportions will vary for each species of tree and will be different in every kind of soil. No safe rule can be laid down and the gardener should consult a landscape architect who, for a reasonable fee, will prescribe the proper treatment."

Let him prescribe it. Let him have the tree. Let him have the land, too. The owner will move into a cosy apartment where he has only to switch on the thermostat.

SIMPLE RULE

After a half century's experience with gardening, after violating every rule and harvesting such crops as no expert has ever imagined in his wildest moments, I have constructed a simple rule which, if strictly followed, will cure all the ills of the garden:

"Dig a hole ten feet deep, six feet long and four feet wide. Fill the bottom with perpendicular iron spikes, sharpened at the upper ends, and cover with a thin layer of quicklime. In this, plant the nearest garden expert, taking care to spread him out flat, face downward. And then quickly fill the hole with the heaviest clay obtainable, tramping it down well and capping the top with a slab of concrete two feet thick, with a suitable inscription.

"After this has been done, the gardener can go safely about his business."

The Art of Propagation

W. EMERSON

Gardener to the Lieutenant Governor of Manitoba

From the time man changed from a nomadic life to an agricultural life, one of his main problems was to reproduce in his garden the improved forms of plants he found in the wild and later to improve them again by selection and hybridization. With cereals and some annuals this was easy as he had found by experience that these kinds mainly came true from seed which he had collected; however, with fruits and later ornamentals, this was a different matter as usually they reverted back to a much more inferior type.

By observation he found that some shrubs reproduced by sending out suckers, or branches rooted where they came in contact with the soil. Gooseberries, currants, dogwoods and lilacs were some of these types, so that propagation by layering came into being.

However, most shrubs are horticultural developments, either sports from a single species, or hybrids resulting from cross pollination of two or more species. Such plants do not come true from seed, and many of them do not throw up suckers nor do they root by layering. Man has had to devise ways of propagating these shrubs and fruits vegetatively, so the methods known as propagating by "cuttings", "grafting", "budding", "air layering" have been developed.

HARDWOOD CUTTINGS

A large number of shrubs are grown readily from cuttings taken in the fall after a few light frosts have ensured the thorough maturity of the wood of the past season's growth. This wood is cut into lengths containing two to four healthy leaf buds. The cuts must be made cleanly with a sharp knife, with the basal cut just below and the top cut just above a leaf bud. The cuttings from six to ten inches long are tied in bundles with the butts all pointing the one way, and are buried horizontally in sharp sand in a cool cellar or a cold frame.

In the spring they are planted out about six inches apart, in nursery rows, in well-drained soil. Usually they are planted on a slant against the side of a trench with only the top bud or pair above ground. The soil must be packed firmly against the lower ends so that they will not dry out. The cuttings must be kept free of weeds and at the end of two years should be large enough for their permanent positions.

The following are propagated from hardwood cuttings: Dogwoods, Honeysuckles, Roses, Forsythia, Mock Orange, Currants, Elders, Willows, Hydrangea (*Arborescens*).

IMMATURE OR GREENWOOD CUTTINGS

Most shrubs, including the above, may be reproduced by means of cuttings of immature terminal growth taken at varying times throughout the growing season according to the species. As this method involves more careful handling and attention, usually it is practiced only with those sorts which will not root from dormant cuttings of mature wood.

Soft wood cuttings are of two main types: (a) young terminal growths from two to four inches long cut off just below a leaf joint or node; (b) young lateral growth from two to six inches long torn from last year's wood so as to leave a heel of last year's wood attached.

In either case only the lower leaves are trimmed off, leaving three or four leaves at the top. In the case of some very large-leaved sorts, the top pair of leaves are cut in half.

As has been stated before, the correct time to take these cuttings will vary with the species and the season. As a general rule, the cuttings should be taken when growth in length is almost complete, but before wood begins to ripen. The growth of most shrubs at this time will "snap" when bent between thumb and forefinger.

The cuttings are planted in a mixture of half sand, half peat moss, or in Terra-lite vermiculite, in cold frames, or in nearly spent hotbeds where slight bottom heat is provided. Boxes and pans also may be used for small lots. The frames are kept closed except for a little ventilation during mid-day, and the cuttings are sprayed lightly with water at frequent intervals during the day. The secret is keeping air temperatures low and humidity high to prevent wilting.

Beds or boxes should be treated with a strong solution of potassium permanganate at the rate of one ounce to one gallon of water, used at the rate of two quarts to each square foot. Also, the cuttings should have their base end dipped in one of the rooting mediums such as Auxan, Rootone, etc. Many of the perennials may be propagated in this way too. *Lythrum* is exceptionally easy this way.

LAYERING

The principle in layering is to induce the plant to produce roots from its branches, then to cut the branch below the roots and thus secure a ready-made growing plant.

Two methods are used: (a) earth is banked up around the plant in July so that the roots will be produced from the base of each branch covered. The plant is then dug up and divided, or the rooted branches removed and the stock plant left for future use; (b) branches of the parent plant are bent over, pegged flat on the ground and covered with earth three or four inches deep, leaving the tips of the lateral branches above ground. A piece of thin copper wire wound around the branch, or a cut made with a knife just through the bark and only

part-way round, will assist in making the branches root. This work is done usually in July or August after the period of active growth is over. The branches are lifted the following year after roots are formed and the rooted portions are cut off and planted.

GRAFTING

Grafting is not often practiced in the reproduction of shrubs although some are done in this way. Other means must be used whenever shrubs will not come true from seed or strike satisfactorily from cuttings. Grafting is used most commonly in the propagation of many trees, but because this work involves more handling and is done in the winter, this method is not popular with shrubs other than lilacs and fruits.

BUDDING

Budding is used in propagation of horticultural varieties of plums, apples, lilacs, roses, etc., which do not start readily from cuttings. In most cases it is done in July or August. The proper time is towards the end of the season of active growth but while there is sufficient sap flow to allow the thin bark to peel back from the wood without cracking; this time the buds in the leaf axis will be well developed. The stock must be of close relation to the desired variety to be budded, for example: apple on crab apple stock; plum and cherry on plum and cherry stock; roses on rose stock, etc.

The stock should be from $\frac{3}{8}$ to $\frac{5}{8}$ inches in diameter and the bud place as near the ground as possible and on the north side of the stock. With a sharp, thin-bladed knife a vertical cut is made low down on the stock about 1 to $1\frac{1}{4}$ inch in length. The cut should be just deep enough to penetrate the bark to the wood. A second, crescent-shaped cut is made across the top of the first cut to form a letter "T" with the ends of the cross-piece drooping a little. This droop helps in the next step which is to turn back the corner flaps of bark carefully to allow the bud to be inserted.

The buds are taken from as nearly mature wood of the current season's growth as can be obtained. The leaves are trimmed from the bud sticks, but part of the leaf stem is left to act as a handle and protection for the bud. The bud sticks should be kept in water until needed. With the knife remove the bud from the stick with an accompanying shield of bark about one inch long and wide enough to leave a margin of about $\frac{1}{16}$ inch of bark on either side. The thin sliver of wood which is removed with the bark may be removed or disregarded. The bud shield is held by the leaf stock handle, and pressed down into the cut on the stock so that it will be held in place by the corner flaps of bark on the stock. Any of the top of the bud shield which protrudes above the cross cut of the "T" should be removed.

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The union is bound firmly below and above in that order with raffia, string, or rubber bands made for budding, care being taken that the bud itself is not covered. After a few weeks, when union is made, the binding is cut off to prevent the bud from strangling. The following spring, the stock is cut to about six to eight inches of the bud and all growth is rubbed off except the bud, which is tied to the stub of the stock when it is about six to eight inches long so as to make it grow straight.

For more detailed information on budding and grafting, the Department of Agriculture, Ottawa, sends out on request valuable information.

AIR LAYERING

One of the most recent methods of propagation is known as air layering but so far it is used only on indoor plants, such as Rubber plants, *Dracaenas*, *Philodendron*, *Crotons*, *Dieffenbachias*, although in the south it can be used outside.

The method is as follows: After selecting the plant to be air layered, the first step is to wound the stem at the point where the roots are desired. This is done with a sharp knife in either of two ways, i.e., by making a longitudinal cut upwards for an inch or so into the centre of the branch, or by removing a complete circle of bark about $\frac{1}{2}$ inch wide from the stem. The slit portion or barkless area is rubbed with one of the rooting hormones. In the case of split stems, a wooden match stick or a small bit of moistened sphagnum moss should be inserted between the cut surfaces to prevent closing and healing of the cut.

The whole area, including an inch or so of the stem on both sides of the cut, is then wrapped with a handful of moistened sphagnum moss. The moss must not be dripping wet when applied to the stem. All excess moisture should be squeezed out. Finally a sheet of plastic film is wrapped carefully over the ball of moss with upper and lower ends twisted around the stem and securely tied. In wrapping and tying the plastic, the moss should be well contained with no openings remaining in the film.

Once the roots have formed on the stem, the job is only half done. The rooted stem must be cut from the parent plant just below the rooted area. The plastic film should be removed and then the stem potted. The new plants must be set in the shade and away from drafts for at least two weeks to allow the roots to become accustomed to the new medium. A little water-soluble plant food, such as Instant Vigoro, added to the water used to moisten the moss seems to be of benefit.

More information on this new method will become available from time to time.

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Rose Growing In Western Canada

J. H. NICHOL, Winnipeg, Man.

The general feeling has been until only recently that Roses could not be grown and successfully wintered in Western Prairie Canada. The increased interest in Rose Growing is evident by the large increase in entries at all the fall flower shows, despite the fact that Roses are generally past their best at show time.

I do not know of anything in our garden that gives us more pleasure than the Roses. Our Rose bed is about four feet by twenty feet and contains 35 Rosebushes. This supplies us with flowers for cutting, and a continuation of bloom throughout the summer.

LOCATION OF ROSE BED

Roses like lots of sunlight, and do well in our heavy soils provided you do not select a poorly drained location. We prefer to plant roses in a bed by themselves, as they do not like competition from other annuals or perennials. They also make a better show if planted together in a bed. Therefore, in selecting the location for the Rosebed a well-drained spot should be chosen, where there will be full sun for a good part of the day. A good location is one running East and West with a fence or hedge on the North side which provides protection from the wind and aids in keeping the winter protection on the Rosebed.

PREPARATION OF ROSEBED

To properly prepare a Rosebed you must keep in mind that the Rosebed is a permanent planting. Firstly, the top soil should be removed to the depth of the digging fork. Next dig the subsoil deeply, and work into this about 4 inches of rotted manure. Now replace the top soil working in more rotted manure.

PLANTING PROCEDURE

One of the most important things in successful Rose growing is proper planting depth. Most of the Roses we grow here are grafted onto Multiflora Rose roots. When you look at a Rose bush you will see a swelling or bump on the stem, a couple of inches above the roots. This is where the grafting occurred. This graft should be about 2 inches below the ground level when planted. Roses should be planted at a minimum of 18 inches apart depending on the variety. In planting dig a good-sized hole about a foot deep, mixing in a small handful of bonemeal in the subsoil. Mound up the earth in the centre

of the hole and spread out the roots over the mound. Now fill in the earth and tamp the earth firmly, making sure that the graft is 2 inches below ground level. If the bed has not been prepared before planting then dig hole deeper and mix in rotted manure with subsoil, and procede as above. Next, thoroughly soak soil around Rosebush mounding up soil around Rosebush to help to prevent the Rose drying out while it is getting established.

Should your Rosebushes arrive too early for planting outside, they may be planted in apple boxes and kept in a cool place until you are able to plant them in their permanent location, or can be heeled in outside.

PRUNING

In general very little pruning is required, other than cutting out any dead wood, late in the spring, after the new growth has started. If there are a large number of live branches on the overwintered Rosebushes, then cut out the weaker branches leaving 4 to 6 strong stems which will develop into a shapely bush. The uppermost eye on the pruned branch should be pointing outwards. Generally, little pruning is required during the summer. In cutting the blooms don't be afraid to cut some of the stem with the flower, as cutting the stem helps to stimulate new growth. This is especially true in the spring, as with proper cutting of flowers, growth is stimulated for the production of more flowers in the fall. In cutting blooms keep in mind that 5 leaves should be left on the branch between where the cut is made and the main stem. If only the flower is cut off growth is retarded.

VARIETIES

The Hybrid Tea Roses are the most popular Roses grown here. These produce the largest, and probably the most perfect blooms, and also produce flowers twice a year. The finest Rose we have grown in this class is the Peace Rose. It is a very sturdy grower, generally producing one bud per stem. They form a large perfect bud and when fully open are solid in the centre. The flowers are immense in size, lasting a long time either cut or on the bush. In the bud Peace Rose is a deep cream color, with the edges of the petals a light pink. When open they are a light cream color with a flecking of pink. In the fall the flecking is generally darker. An old Rose I like is Etoile De Holland. It is a dark red, large flowered, lovely in the bud, but only semi-double when open. It is very fragrant, excellent for cutting and an abundant bloomer. McGredys Scarlet has done well for us. It has perfect buds, and is an abundant bloomer. The colour is bright red, has a delicate perfume, and a good Rose for cutting. Other Red Roses we have grown with some success are Crimson Glory, New Yorker, Charles Mallerin, and Grand Duchess Charlotte.

Specs Yellow is one Rose I feel should be in every garden. It is only medium in size, but a very abundant bloomer, excellent for cutting, and makes a fine show in the garden. McGredys Yellow and Eclipse are also good Yellow Roses, both producing large perfectly shaped buds, and good for cutting.

Our favorite pink is Dame Edith Helen. This is a delicate pink color, similar to Specs Yellow in size, an abundant bloomer, and excellent for cutting.

For two-toned varieties we have tried Contesa De Sagtato; when fully open inside petals are fiery Red and outside petals yellow. Autumn is a strong grower producing large flowers of a striking color combination of orange, yellow and red. It has a tendency to be a little weak in the stem for cutting.

I like to include Polyantha, and Florabunda Roses as they add a lot of colour to the Rosebed, and have a longer blooming period than the Hybrid Tea Roses. Some of the newer varieties are only slightly smaller than the Tea Roses. It is not uncommon to have 30 to 50 blooms from one of these Rosebushes.

Donald Prior is an outstanding Polyantha Rose. It is a vigorous grower producing large semi-double flowers, 3 to 4 inches in diameter, of a bright crimson scarlet colour. It is excellent for cutting, and makes a very good showing in the garden. It will bloom almost continually throughout the season.

Elsa Paulson is an excellent pink. It is more double than Donald Prior, not quite as large, deep Rose pink when first open, and gradually fading to a light pink. Other Polyantha Roses we have are Gloria Mundi orange; Kirsten Paulson single pink; Pinnocchio double Pink, very pretty bloom but plant not a strong grower for us.

We have tried several Florabunda Roses in the past two years. These include Floradora, vivid flame orange red, with large perfect buds; Fashion, coral pink, prolific bloomer, lovely in the bud, opening to about 2 inches in diameter. Other good Florabunda roses include Ma Perkins coral pink; Goldilocks, yellow; Vogue, cherry-coral.

INSECTS AND DISEASES

One of the biggest problems here is with aphids. Roses are very susceptible to aphids. The aphids spread very rapidly unless control measures are taken immediately aphids are discovered. Spray with Black Leaf 40 or dust with Endopest or Rosedust as per directions. This should be started shortly after the new leaves appear, and continued at least once a week throughout the season.

We are fortunate here in that most of the major Rose diseases are not a problem. In this category we have Mildew, detected by the greyish crinkled appearance of the leaves.

On first appearance dust leaves with Flowers of Sulphur or Fungtrogen.

Black spot rarely occurs before late summer; appears in large black or purplish spots on the leaves, which eventually drop off. Use Fungtrogen or Bordeaux mixture at first appearance.

WINTERING ROSES

A great many different methods are used here to winter Roses. I want to deal with the method we use which is not necessarily the best, but has worked with good success for us. Six of the original seven Roses purchased in 1950 were still blooming last summer. The seventh was planted with the graft above ground level, and didn't survive the first winter. Firstly, we cut the Rosebushes down to 12 to 15 inches after a severe frost. In the fall we collect all the Oak leaves we can and pile them near the Rosebed until the ground has begun to freeze. We then cover the entire bed to a depth of 2 to 3 feet. It may be necessary to put branches on top of the leaves to prevent them from blowing away. When the Rosebed is beside a hedge or fence, there will be less chance of the leaves blowing away than if the bed is in the open.

Do not be in too great a hurry to uncover the Rosebushes in the spring as it is the alternate freezing and thawing in the spring that causes most winter killing. We generally remove about half the leaves towards the end of April, or early May, depending on the weather. The rest of the leaves can be removed from May 15th to 24th.

In buying Rosebushes, buy only field grown grafted Roses, from a reliable grower. Do not buy Rosebushes that have been used for forcing in the greenhouse, as these generally don't give the satisfaction that you will get from field grown grafted Roses. In general, when you purchase Rosebushes from the larger Rose growers you get sturdy 2-year-old grafted Rosebushes. The Rosebushes found in the local stores are usually only year old bushes, but will give good results. These should be bought as soon as they appear in the stores. Choose sturdy bushes that have nice green wood, and show no signs of having been dried out.

In closing I would like to summarize the main points required for successful Rose growing.

1) Locate Rose garden in full sunlight, in a well-drained location.

2) Fertilize Rosebed annually, and water thoroughly at frequent intervals.

3) Plant with graft 2 inches below ground level.

4) Spray or dust frequently for control of Aphids.

5) Cover with a deep layer of leaves in fall after ground has frozen.

6) Purchase only field-grown grafted Rosebushes.

Hardy Chrysanthemums

S. J. WESTAWAY

Division of Plant Science, University of Manitoba.

Many of our most desirable horticultural subjects are easily grown; yet are only grown to perfection by the exercise of patient care. This is true of the well-known chrysanthemum grown in greenhouses and sold in the florist stores. Of this group our recent interest has been aroused by the prospect of growing hardy forms outside in our northern zone.

This cultivated form, *C. hortorum*, has been developed in Europe in comparatively recent times from *C. indicum* and *C. morifolium*, two species that grow wild in China and Japan. Since their first introduction into France and later into England, however, variation and hybridization has resulted in an amazing range of form and color; the indoor types favored as cut flowers and the outdoor and less developed types, more dwarf in form, giving a wide range of colour in the fall garden.

In more temperate zones the hardy outdoor types have been characteristic of the fall scene. It was thought, however, that the occasion of early frosts, and the fact that chrysanthemums usually will not flower until the short days of fall, would preclude their effectiveness in our own gardens. Recent work in the Northern States, at Dropmore, Manitoba, and at the Morden Experimental Station has shown that very effective use can be made of them, and they have the merit of blooming after the landscape has been desolated by successive frosts.

To get the greatest benefit from them it has been necessary to carry out a rigorous program of selection based upon earliness and upon hardiness. The original stock material was grown from seed of early blooming types grown at a high altitude from wintered-out selections. With the change of locale it was found that much re-selection was necessary. This has already resulted in a decided fixing of the traits of early blooming in a high percentage of the plants grown from seed. Seeds sown indoors in March grown in flats and pricked out the last week in May have given bloom from the first week in August until the end of October, a very desirable and colourful achievement.

Hardy mums are among the easiest of plants grown, but to grow them at their best they require good culture, rich soil, a sunny exposure and a plentiful supply of water during the hot weather. Although the shorter days of fall are conducive to flowering, the plants require plenty of light for their proper

development. Avoid shading by buildings, large shrubs or trees. Good cultural practices that apply to other garden crops apply equally well to chrysanthemums.

Well-grown plants developed from seed can be set out in position in the garden as soon as spring garden work is well under way, usually from the middle to the end of May depending on the season. Reasonably early planting is to be desired to give the plants adequate time to develop roots and enough top growth to give abundant bloom. Such plants well rooted or plants developed from virgin cuttings are preferable.

Field clumps rarely give satisfactory results because they have insufficient roots to support the numerous shoots that emerge from the clump. In replanting old clumps divide them into individual shoots using the outside shoots, which are the sturdiest. To propagate, it is preferable to lift in the fall, pot up in a suitable container and keep in slow growth in a greenhouse or other suitable place until March when new plants can be rooted from cuttings and potted later in individual pots preparatory to setting out at planting time. They produce better and more floriferous plants than divided clumps available only late in the season.

Freedom from weeds, frequent loosening of the soil about the plants, available moisture, is required to grow good plants. An occasional application of fertilizer may be helpful, but if the area has been adequately prepared with the addition of barnyard manure prior to planting it may not be required. Irrigation should be supplied as soon as the hot days of summer deplete the available moisture in the soil.

To develop sturdy well-branched plants terminal shoots should be pinched once or twice during the season. Remove about half an inch or so of the soft growing tips of the new shoots. Pinch when the plants are about six inches tall. This will induce lateral growth. Well developed plants will be sturdy and stand erect.

Mums are subject to pests which delay their growth and interfere with proper flower development. Among these, aphids, leaf hoppers, and tarnished plant bugs are the most damaging. Weekly sprayings with 50% wettable DDT or Malathion or a combination of the two are effective. Particular attention should be given to the depredations of the tarnished plant bug at the time the buds are forming, when they pierce the buds causing a deformity in the flower form. An occasional dusting with Fermate or Sulphur will check fungus diseases of the foliage.

Blooming will begin early in the selected types, and the criteria of the last few years indicate that blooming will continue until quite heavy frosts destroy both flowers and foliage. Early frosts may affect the early flowers but frost tolerance

on the part of the buds ensures more bloom when the weather tolerates. The shorter the days, the earlier will be the blooming season, in fact, it is considered that every 100 miles difference in latitude will make two days difference in blooming time. The variety and range of colour through a long fall season is a very desirable addition to our prairie gardens.

We assume that by hardiness the plants will continue to bloom year after year with a minimum of care and with increasing splendor, but the foregoing may be somewhat of a disillusionment. Well-grown young plants give the most desirable results. To carry over the older plants they should be located in a well-drained position and covered with some dry loose material after the ground is slightly frozen. The purpose is to keep the ground from alternately thawing and freezing. Evergreen boughs or similar material that will encourage a good snow cover is helpful.

A number of named varieties are available on the market of which a few may be listed.

Dorothy	—	White
Dr. Speechly	—	deep pink
Pigmy Pink	—	rose pink, dwarf
Richelieu	—	dark red
Goldilocks	—	yellow
Glacier	—	white
Harmony	—	bronze
Purple Star	—	purple
Morden Gold	—	bright yellow.

Growing mums from selected seeds and treating as annuals has particular merits. Sown early indoors, the plants may be transplanted like other annuals and will develop the same season to give a great variety of form and color. If you have an opportunity to try some they are well worth the effort.

J. H. FROM

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Aster Yellows

DR. B. PETURSON

Dominion Laboratory of Plant Pathology
Winnipeg, Man.

Aster yellows occurs in western Canada every summer on a number of cultivated and wild plants. Perhaps the hosts most seriously affected in this area are China asters and carrots. The present article deals with this disease mainly as it affects these two hosts.

Besides the two varieties already mentioned, aster yellows occurs on a very large number of plants. About 300 widely different varieties are known to be susceptible to it. Some of these are: chrysanthemum, cosmos, gladiolus, marigold, petunia and snapdragon among cultivated flowers; celery, lettuce, onion, potato, spinach and tomato among the vegetables; and dandelion, milkweed, plantain, sow thistles, and wild aster among the weeds.

YELLOW S OF CHINA ASTER

Symptoms:

The first sign of this disease on China aster is a yellowing along the veins of the leaves. The leaves of developing shoots become whitish yellow. However, leaves that have matured before the plant is attacked do not lose their colour. Numerous yellowish side shoots develop. These are usually abnormally tall while the main stem is shorter than normal with short internodes. Often, one side of a leaf is more affected than the other and a deformed leaf results. The diseased flowers are greenish yellow. Frequently, only a part of the flower is affected and it always is smaller and lighter in colour than the unaffected part. An aster plant affected with yellows can be recognized readily as a diseased plant owing to its pale green appearance and to the abnormal upright position assumed by the leaves and shoots. Plants which become infected at an early stage do not produce any seed but ones which become infected late may produce seed. However, it has been found that the disease is not transmitted to the seed. Affected plants do not wilt and die but usually live to the end of the season.

Cause:

Aster yellows is caused by one of a group of disease-causing agents called viruses. They are very small entities, much smaller than bacteria, and have some properties of living organisms and some properties of non-living matter. At present, it is perhaps best to consider them to be on the borderline between living and non-living matter.

Spread of Yellows:

Yellows does not spread from plant to plant by contact. Touching an infected plant and then rubbing the leaves of a healthy one does not transfer the disease to the healthy plant. The disease is spread from plant to plant by leaf hoppers. Several kinds of these insects are involved. When a leaf hopper feeds on an infected plant it takes up the virus which causes the disease. Then, after a period of from 10 to 14 days after it takes up the virus, it can transmit the disease. The reason why the hoppers cannot transmit the disease immediately after they pick up the virus is not definitely known. It is thought that the virus increases, or multiplies in the body of the insect, and that this virus multiplication must take place before the insect becomes capable of spreading the disease. None of the leaf hoppers which spread aster yellows can live throughout the winter in western Canada and the adjacent states of the U.S.A. The leaf hoppers overwinter in the Northern States principally in the egg stage. In the Southern States, they live throughout the winter as adults. The overwintering hoppers and those hatched in the spring from eggs laid in the Northern States migrate northward into our area each summer.

Control:

There is no satisfactory control for aster yellows. The only known method of control is to keep the hoppers away from the plants. This, in practice, is very difficult. Repeated spraying of the plants with insecticides to keep down the leaf hopper population has not proved effective. The reason for this is that soon after each spraying of the garden and destruction of the leaf hoppers present, a new crop of these insects moves into the garden from surrounding areas and the result of each spraying is soon nullified. However, in some areas where asters are grown for the flower market, the aster beds are protected by means of cheese cloth. This method of control has been found to be effective but expensive. Diseased plants should be pulled and destroyed as soon as they appear and susceptible weeds controlled in the garden area.

YELLOW OF CARROTS

Yellows is one of the most important diseases of carrots in many parts of the Prairie Provinces. The disease varies considerably in prevalence from year to year but is present to some extent every summer.

Symptoms:

First, a yellowing of the leaves at the centre of the crown occurs. Then, numerous pale greenish shoots are produced at the centre of the crown giving a witches'-broom appearance to the plant. The outer leaves often take on a bronze color

and become more or less twisted. A large number of very fine fibrous side roots develop from the main root. As a result of this, an abnormally large amount of earth clings to the roots when they are pulled. The carrots are reduced in size and quality and the flavour of the roots is impaired.

Cause:

Virus — The same virus which affects China aster causes yellows of carrots.

Control:

Destruction of susceptible weeds in and around the garden. Frequent application of insecticide such as DDT. It must, however, be admitted that these control measures have not been very effective. No carrot varieties have been shown to have any appreciable resistance to aster yellows.

Tips on Growing Paper Whites

W. EMERSON

Gardener to the Lieutenant Governor of Manitoba

Most of us who grow paper whites are met with the problem of how to make them last over a longer period of time, and also how to keep them shorter.

Here is a way that has given the writer the most success. Buy your bulbs when they first come on the market in quantities of 25, 50, 100, or whatever number you desire. Place the bulbs in the crisper of your refrigerator, or in the bag they came in at the bottom of the refrigerator. Leave them there for four weeks or longer, then choose a fancy dish, bowl, etc. Make a layer of small pebbles or stones in the bottom of this dish. Take six or more paper white bulbs, or whatever your dish will hold, from your refrigerator, selecting only those which have the longest shoots, about two inches or more in length. (Leave the remainder of them in the refrigerator until required.) Place these on the stones in your dish and then fill the dish to the top with stones or pebbles, working them around the bulbs to hold them in place. Now add water until it comes to the base of the bulbs. Put your dish in the basement fruit or vegetable cupboard, keeping it in darkness or semi darkness. Check your bulbs every three or four days adding more water to keep it level with the base of the bulbs.

When you can see the buds between the leaves, four to six inches in height, bring them to the light of a north window for a few days until they turn green, then place them in a south window until they open, approximately four or five days, turning bowl every day.

Repeat this procedure until your supply of bulbs has been used up, selecting each time the bulbs with the longest shoots. In this way you can have paper whites at your bidding.

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Pruning Shrubs

DR. W. R. LESLIE

Superintendent, Dominion Experimental Station
Morden, Manitoba

Pruning Shrubs in the Canadian prairies is performed to good advantage in April and early May. Autumn pruning is dangerous as the large wounds cause much loss of moisture during the winter and the cut tissue may be injured by prolonged severe frosts and penetrating cold winds. Those shrubs on which flowers arise on one-year wood have the pruning delayed until after flowering. That means summer pruning. It is performed as soon as the flowers fade. In contrast is the class which bear flowers on wood of the current season's growth.

Pruning is for the purpose of growing a graceful, well-balanced specimen, to open up the centre for sunlight and air to bathe all the wood, thus encouraging formation of flower buds on healthy tissue. It is desirable to retain the natural shape of the subject unless it is overgrowing its position or is serving as a clipped hedge.

Spring Pruning: (a) Among those cut back to short stubs near the ground before growth commences are *Amorpha*, *Buddleia*, such summer-blooming *Spireas* as *Froebel* and *Anthony Waterer*; *Hydrangea*, *Hybrid Tea Roses*, *Sorbaria*, and those *Tamarix* which are wanted to produce late bloom on long, young strong shoots. In this class are willows and dogwoods grown as coppice for their bright colored winter barks. (b) The second class requires thinning out of oldest stalks to ensure thrifty growth while retaining natural symmetry and character of outline. In this category are *Shrub Roses*, *Flowering Crabapple*, *Cherries*, *Plums*, *Almonds*, *Dogwoods*, *Cotoneasters*, *Sumac*, *Elderberries*, *Philadelphus*, *Physocarpus*, *Symphoricarpos*, *Weigela* and those foundation shrubs which are becoming overly dense.

Early Summer, immediately as flowers fade, to cause a flush of young growth for next year's flower production: *Lilacs*, *Honeysuckles*, spring-flowering *Spireas*, *Caragana*, *Salttree*, *Clove Currants*, *Japanese Quince*, *Ninebark* and *Viburnums*. Remove older branches low down so that there will be plant renewal by growth of strong new basal shoots.

Many shrubs require only a little pruning every 2 or 3 years as there is little tendency to form a mass of central stems. The gardener will be guided by each shrub. Pruning is undertaken only when the plant's condition indicates a need. Avoid long stubs by cutting flush to a main stem. Remove interfering branches, broken or injured parts and all dead

wood. Use sharp tools. Cut at an angle rather than straight across the branch and to a bud pointing in the direction new growth is desired.

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Winter Storage of Bulbs and Tubers

S. J. WESTAWAY

University of Manitoba — Division of Plant Science

Many of the most effective and colorful flowers that we grow are developed from corms, bulbs or tubers which will not carry over in the soil due to the severe climatic conditions of our winter season. Favourable storage must be afforded them during this latent time.

1. **DAHLIAS** are readily killed back by the early fall frosts. The stalks should be severed from the tubers leaving about three inches of the stalk attached. The clumps may be lifted within a week or so, care being taken not to damage the individual tubers which are attached by the long neck to the rest of the clump. Buds or eyes of the new growth develop from the attachment of the tuber and stalk. It is better to lift the clumps during favourable weather when the tubers may be allowed to dry in the sun for a few hours without damage. Remove excess soil and place in a storage cellar, preferably in one with an earthen floor, under conditions which are suitable for potato storage, having a temperature of 35° to 45° and a reasonably humid atmosphere. If a potato storage cellar is not available, packing in boxes of granulated peat moss, peat and sand, or granulated insulating material is necessary, moistened from time to time and kept in the coolest part of the basement. During mid-winter, inspection of the tubers is necessary when decayed or damaged tubers should be thrown out, and the cut surfaces given a dusting of finely powdered sulphur. If shrivelling occurs, the packing material should be moistened as required.

2. **CANNAS**. While not as extensively grown as the dahlia, the canna can be effectively used for startling and contrasting effects in the landscape. Storage of the roots is similar to that prescribed for the dahlia, but it is preferable that the storage is drier and warmer. Dryness is a prerequisite and the temperature should be in the neighborhood of 45°, for cool and damp conditions result in rotting of the roots. The roots should be dug soon after the foliage has been killed by frost, and allowed to dry in the sun for a few hours. Keep them in an airy location for a few days to facilitate drying when they may be stored in peat moss, or a mixture of peat and sand in a dry basement. While drying is preferable, the roots should not be allowed to shrivel; they may be lightly sprinkled on occasion.

3. **TUBEROUS BEGONIAS** are grown more generally in pots, window boxes, and occasionally as bedding plants. They are best removed or lifted before frost arrives and stored in the pots or with the soil adhering in boxes in a dry basement, allowing the tops to ripen and die down. An occasional light watering will make the process of ripening gradual. Storing with soil attached at about 50° in a dry basement is preferable. The bulbs should be rubbed clean of soil in early April. Start into growth by pressing the bulbs into a light fibrous mixture of sand, peat, and humus over bottom heat, covering the container with a sheet of glass to maintain a favourable and humid atmosphere. When sufficiently rooted, pot in the regular manner, using a loamy mixture.

4. **GLADIOLI.** Because of their popularity, gladioli deserve every consideration necessary for favourable storage. Corms carried over in good condition are good economy and a favourable start for another season.

When the foliage ripens, or frost has been severe enough to brown its foliage, corms should be dug. Choose a bright, warm day if possible and allow the corms to dry on the surface for a few hours to facilitate removal of excess soil. Tops should be cut off within an inch of the corm, first culling out any plants which show signs of disease. Put in shallow boxes or paper bags. If paper bags are used allow the bags to remain open to aid in the curing process. Place them in a warm, dry, well-ventilated room or spread evenly over the floor. When sufficiently cured the adhering soil, dry husks and roots should be removed. Corms should be dusted with a 5% DDT powder to control thrips, or naphthalene flakes may be added to the corms in paper bags. The naphthalene flakes are allowed to remain in the bags for a month or six weeks when the corms are shaken out, the bags perforated and the corms replaced, keeping them at about 40° in cool, dry storage. They should be inspected at intervals and shrunken corms removed.

Care should be taken not to store at too high temperatures, and avoid excessive growth prior to planting.

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Currants and Gooseberries

W. SHELMERDINE

Shelmerdine Nursery, Charleswood, Man.

It is quite possible that gooseberries and currants would be more widely grown if it were not for the damage done by the Currant Fruit Fly. Most of us, at one time or another, have seen these bushes heavily laden with large clusters of berries only to find, upon closer examination, that each berry has a tiny dot upon it. This dot marks the spot where the Fruit Fly has pierced the skin to lay her egg. These same berries later ripen imperfectly and unevenly and usually drop prematurely. Upon opening a berry, one finds a small maggot. Before the days of DDT, it was practically impossible to produce worm-free berries because the parent fly moves around so constantly, and eats practically nothing at egg-laying time. Pamphlet No. 46, obtainable from the Publications Branch at Ottawa, tells us how to deal with the fly.

Make a spray by adding two teaspoonfuls of 50% wettable DDT to one gallon of water and spray it thoroughly all over the bush about the time almost all the blossoms have faded or fallen, and again ten days later.

Cultivated red and white currants originated in Europe and Asia and are the same in fruiting habits. The black currants come from the same area but differ in fruiting habits from the reds and whites.

As most cultivated currants and gooseberries like a cool moist soil, the soil around Winnipeg should be quite satisfactory for their propagation, provided one has good drainage. On lighter, dryer soils it is suggested that the area around the plants be mulched four to six inches deep from early spring until after fruiting, after which the mulch is removed and clean cultivation is resorted to. Currants and gooseberries benefit from well rotted manure worked into the soil every year or two.

Two hundred or more different recognized varieties of currants are grown in North America. These include some grown as ornamentals. It has been found that where drought conditions prevail, the ornamental varieties are most satisfactory for fruit. The Flowering Currant or Missouri Currant is one, and the Buffalo Currant, whence comes Crandall, is another.

To prune currants when first planted, cut the stems down to two or three inches in height. This should cause the plant to send out more stems. At the beginning of the second year, all the stems should be cut off two or three inches above the point where they were last cut off. This should again create

more stems. From thereon, it is important to prune to have a maximum of one and two-year-old wood on the black currants and mostly two and three-year-old wood on the reds and whites. Try to maintain ten or twelve main shoots. With black currants allow about five or six one-year-old shoots to remain and remove an equal number of shoots that have passed the second year. With red and white currants allow only three or four of the one-year shoots to remain and remove three or four that have passed the third year. Prune in late March or early April. Towards the end of eight or ten years, a new plantation should be started.

As both currants and gooseberries start to grow early in spring, it is best to plant them quite early, possibly late April. Plant gooseberries five feet apart and currants six feet apart, with six feet between rows of both.

Among recommended varieties of currants are:

Red — Red Lake and Stephens No. 9

White — White Grape

Black — Kerry and Climax

When planting out new plants, most pamphlets and texts tell us to set the plant somewhat deeper than it was formerly. From my experience it is best not to take this too literally, especially if one has very heavy soil like the area around Winnipeg. Vary the depth of planting with the lightness or heaviness of the soil. In planting a fruit tree, for example, I usually throw up a broad, low mound and plant the specimen in this. This means that the plant is slightly higher than it would be otherwise.

Gooseberries (and the word "goose" is said to come from the French "groise" meaning "hairy") can be divided roughly into European (*Ribes grossularia*), and the American (*Ribes oxycanthoides*) kinds. The European kinds are too tender for Western Canada, the American kinds too hardy. Apparently, no pure American gooseberry is commonly grown for fruit. The prominent named varieties are crosses of the two, European for quality, American for hardiness. There are several hundred varieties in existence and these vary considerably in their hardiness.

A good spinefree variety of gooseberry would be a more than useful addition to the present varieties, and probably would replace the present varieties. At present, I grow only Pixwell.

Prune gooseberries about the same as red and white currants. Gooseberries bear on two and three-year-old wood. Therefore, cut out older wood and keep young stems coming on. Cut out branches on the ground first to keep fruit clean. Gooseberry plantations should be good for ten or twelve years.

Other pests which attack currants and gooseberries are the Currant Plant Louse and the Imported Currant Worm.

The Currant Plant Louse causes the leaves to curl and become distorted, and the upper surface reddish. The eggs of the insects are on the stems near buds and the insects appear about the time the buds open. They are sucking insects that can be controlled with $1\frac{1}{2}$ teaspoonfuls of Black Leaf 40 to one gallon of water, plus one tablespoonful of a detergent. Spray thoroughly as all insects must be hit.

The Imported Currant Worm eats the leaves. The adult lays her eggs on the mid-rib on the undersides of the leaves in early May and they soon hatch the larvae which may be dusted with an arsenical about one to twenty of flour, only while berries are quite small due to the danger of poison.

Tent Caterpillars, if within a tent, may be removed by hand and crushed underfoot. If there is no tent then apply an arsenical as with the Imported Currant Worm.

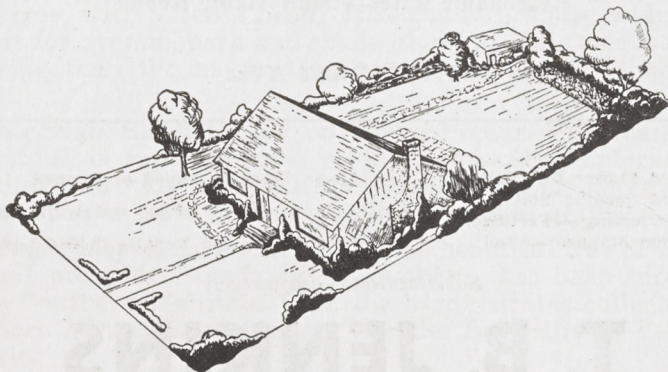
The diseases which occur on the currant and gooseberry include Mildew and result in the leaves having a mouldy appearance and perhaps turn brown and drop. Spray with a solution of soluble sulphur, one ounce to one quart of water, just before the leaf buds open. Spray with a weaker solution of one ounce to one gallon of water just before the flowers open, and with two or three applications of this weak solution at ten day intervals. The same control measures work satisfactorily with Leaf Spot and Anthracnose.

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Some Ornamental Trees

DR. W. R. LESLIE

Superintendent, Dominion Experimental Station,
Morden, Man.

The present era sees advance of astonishing dimensions on many fronts. Horticulture may be relatively slow in progress but evidence at the Morden Experimental Station, the University of Manitoba, Winnipeg City Parks, and some venturesome Commercial Nurseries reveal many uncommon woody ornamentals.

A few of the impressive deciduous ornamental trees which are proving of interest to visitors at Morden are mentioned briefly here. The common trees employed by casual gardeners have received treatment in earlier issues of the Winnipeg Flower Garden.

Amur Chokecherry, *Prunus maackii*, makes a beautiful healthy shade tree, reaching a height upward of 35 feet. The papery copperish bark is warmly showy in winter. The sweetish small black cherries ripen in July and are favorites with song birds.

Swedish Basswood, *Tilia cordata* sp., is a smallish tree with small leaves, fragrant creamy flowers, numerous small fruits and bright tawny winter twig bark.

Mongolian Oak, *Quercus mongolica*, from the northern Orient, is hardy, rather slow growing, and unique in retaining firmly its attractive leaves until late the following spring.

Manchurian Ash, *Fraxinus mandshurica*, is an attractive clean tree, with a dense head. It seems to promise wide usefulness for avenue, park and shade planting. This tree is more imposing than the native Green Ash and hardier than the White.

Algerian Black Poplar or Theve Poplar, *Populus nigra thevestina*, is a hardy form of the Lombardy Poplar class. It makes a striking tree with its formal columnar habit. Bark of the trunk is whitish, that of older branches grayish.

Sugar Maple, *Acer saccharum*, the beautiful tree of which the leaf provides Canada's floral emblem, has been succeeding in Southern Manitoba from the hardy strains collected in Northern Minnesota and in the Thunder Bay Hills of Western Ontario.

Amur Corktree, *Phellodendron amurense*, is an unusual tree from the Orient with opposite pinnate leaves which have distinctive fragrance, and trunks wearing deeply furrowed spongy light gray bark. The tree is tall growing. They are

dioecious, similar to willows and are a consideration for street planting.

Manchu Walnut, *Juglans mandshurica*, seems to be the hardiest as well as the most rapid growing walnut in the Morden plantations. The large tree is round headed, and the bluish bark relatively smooth. The pinnate leaves are much longer than those of American Walnuts. The nuts come in rope-like clusters, commonly eight in number.

Black Walnut, *J. nigra*, of western Minnesota strain, is thriving at Morden. It is well adapted to clay soils and is one of the most beautiful of all hardy trees. The nut meat is tasty and esteemed in candy-making.

Ohio Buckeye, *Aesculus glabra*, is America's Horsechestnut of the prairie region, being native as far west as Nebraska. Although a small tree, growing only to 30 feet, it deserves planting for its pale yellow flowers and its palmate leaves which take on high colors early in autumn. Its spiny fruit commonly bears two or more large red nut-like seeds. This roundish tree is widely adapted.

Amur Maackia, *Maackia amurensis*, a Manchurian tree with pinnate leaves, is a close relative of Yellowwood or *Cladrastis*. The charm is in its white dense upright flower clusters, its two-inch seed pods and its unusual tree form which is suggestive of *Laburnum*, a more showy but tender tree.

Chinese catalpa, *Catalpa ovata*, is another small tree of distinctive character adopted from China. The large lobed leaves may be as much as 10 inches long. The racemes of yellowish white flowers are blotched with orange and violet markings. The seeds develop in a slim capsule, 8 to 10 inches long, which tends to cling into the next year. It is considered a novelty for large grounds.

Russian Mulberry, *Morus alba tatarica*, becomes a small bushy tree about 24 feet high, at Morden. This, the reliably hardy member of the Mulberry group, has relatively small leaves of widely diverse outline. On one tree will be found entire, divided, and variously lobed leaves. The purple sweetish fruit, resembling a narrow blackberry, keeps ripening through about six weeks in midsummer. It is highly favored by robins, waxwings and catbirds. Leaf growth is long delayed in spring.

There are a score and more other trees of interest which merit mention. Among them are Manchurian, Tibetan and Cutleaf Crabapples; Black Cherry, Schubert and Spearfish Chokecherries; Ussurian Pear; Norway, Rocky Mountain, Manchurian and Tatarian Maples; Nannyberry; Fountain Birch; Shadblow, and Allegany Serviceberries; European, Maack and Hamilton *Euonymus*; Manchurian *Aralia*; various

Willows, and Siberian Larch. However, comment here will conclude with mention of two classes of showy small trees of present interest to planters of small properties, namely, Rosybloom Crabapples and Hawthorns.

Rosybloom Crabapples have quickly assumed a prominent place in landscape adornment. They are of charm through bark coloring, tree outline, gay flowers, tinted foliage and showy fruits. Among those now popular in Manitoba are Almey, Strathmore, Sundog, Rupert, Sutherland, Hopa, Oakes, Makamik, Erie, Cowichan, Sissipuk and Rosseau.

Hawthorns form a large and varied group. It must be admitted that they have been very unduly neglected in prairie planting. Probably no other one genus offers so much year-round beauty to the prairie scene. Their dense habit of growth adapts them to local robust weather conditions. Many have horizontal stratifying branches, harmonizing the subject to the wide stretching horizons of the Great Plains area. They have charm in foliage both summer and autumn, also in their abundant bloom, which is usually white. Their showy fruits brighten up the plantings, often until spring has come again. The tendency to be fortified with sharp thorns adds to their character as well as providing plant protection. Bark and winter bud color on some species is bright. The following are some of the kinds performing impressively at the Morden Experimental Station. It is worthy of note that some come from far south and might well have been expected to show tenderness, but are behaving comfortably.

Arnold Hawthorn to 20 feet, large bright scarlet fruit.

Downy Hawthorn to 30 feet, large red fruit.

Christmas Hawthorn to 18 feet, large flowers and large tasty red fruits.

Chinese Hawthorn has deeply lobed lustrous leaves and large edible fruit. The handicap locally has been its periodic injury from Fire Blight disease.

Washington Hawthorn to 30 feet, upright in habit, retains its bright red fruits until spring. Its lustrous leaves become highly colored in autumn.

Kansas Hawthorn to about 20 feet, has numerous thorny branches. The dark red fruits are retained long after its scarlet autumn foliage has fallen.

Spike Hawthorn, with long sharp thorns, makes a strong barrier planting. The small dark red fruits are carried into winter.

Thicket Hawthorn, from New England, grows only to about 9 feet and would fairly be classed as a shrub. The long thorns are somewhat curved. Fruit is reddish brown. It is used as a hedge plant.

Redhaw Hawthorn from Siberia reaches 20 feet. The thorns might be considered as short sharp spines.

Canada Hawthorn, from Quebec, 20 feet tall, has very thorny flexuous branchlets. Fruits are crimson.

Ontario Hawthorn, to 21 feet, has stout thorns, dark green leaves and shiny scarlet fruit.

Fanleaf Hawthorn is narrow but develops many stems. Thorns are long and fruit is crimson.

Cockspur Hawthorn, a small tree, is noted for its long numerous thorns. Leaves become scarlet in October. Red fruits cling into winter.

Four species, thriving in Manitoba, which have black or brownish black fruits are Douglas from Alberta, Blackfruit from Manchuria, Cerro from Colorado, and River Hawthorn from Wyoming.

Toba Hawthorn, developed at the Morden Experimental Station by crossing English Hawthorn with Fleshy Hawthorn pollen, is one of the choice new ornamentals. The small tree grows to about 16 feet, has lustrous lobed leaves, double pink to deep pink flowers and bright scarlet fruits which are showy in winter.

The two common natives are Fireberry Hawthorn, on the prairie regions; and Fleshy Hawthorn, near Lake of the Woods.

A limiting condition in the success with hawthorns is that they be separated at least a quarter of a mile from Red and Rocky Mountain Junipers. Grown in close association, both hawthorns and junipers succumb to Cedar-apple rust. They are alternate hosts for that fungus, a fact that is cause for deep regret.

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Some Uncommon Plants for the Parkbelt

LADISLOVE MARTINOVSKY

Gerald, Sask.

The following is a short description of uncommon plants that I have grown with success. A well sheltered location is necessary. Some of these plants are quite hardy, others require a little covering.

Daffodils, Hyacinths and Narcissus winter very well outside if planted in a sheltered location and covered with four inches of dry leaves late in the fall. The bulbs are planted eight inches deep.

Eremerus, or Dessert Candle, a tuberous plant, grows up to eight feet high. Plant in well-drained, sunny location; very hardy but best to cover not for winter but to keep them from sprouting too early in the Spring.

Maiden Hair Fern, a native of B.C., winters very well here. Leaves are not quite the same as of the variety commonly grown in pots.

Incarvillia, or Hardy Gloxinia, is a beautiful tuberous perennial. Attractive fine cut foliage and several long spikes covered with small Gloxinia-like blooms. Quite hardy and grows well in sheltered location without any covering.

Colchicum, often called Wonder Bulb, will bloom from a dry bulb when dug up and placed on a window sill without soil or water. They grow well if planted in a sheltered location eight inches deep and covered for winter with dry leaves. The foliage appearing in the Spring dies down in mid-summer. The blooms, a number to each bulb, appear in late fall without foliage.

Lycoris Squamigea or Hardy Amaryllis. This bulb sends forth its strap shaped leaves in the Spring, in mid-summer they die down. In late fall it sends up a flower stalk, no leaves. Within a week, the stalk is about two feet high with a cluster of five or six Lily-like, peach-coloured flowers which last for quite a long time.

Hosta, or Plantain Lily, is a hardy perennial with large handsome overlapping leaves. Some with attractive variegated foliage in abundance have funnel-form flowers in loose racemes.

Helleborus, Christmas Rose. I have brought this plant through one winter planted in a sheltered location. It is an evergreen and should bloom in the Spring — cover over with dry leaves for winter.

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Rural & Urban Home Ground Competitions

MRS. J. A. MCPHEE

Chairman, Home Grounds Committee

Dauphin Horticultural Society
Dauphin, Man.

Since the Dauphin Horticultural Society re-organization eight years ago, both rural and urban home grounds competitions have been set up and much interest has been shown, as evident by the ever increasing number of competitors in each section and the general improvement in the appearance of our community.

The Dauphin Horticultural Society was instrumental in setting up the "Farm Home Grounds Competitions." This is a provincial competition but has been particularly well represented during the last couple of years by competitors from the Dauphin area. In 1953, the farm home grounds of Mr. and Mrs. F. Robson, of Dauphin, placed second in the class "over a quarter section," while in 1954, Mr. and Mrs. S. McDonald placed third in the other class covering "up to one quarter section."

Briefly, I will endeavor to outline how the various home grounds competitions of our Society are set up and judged, noting that the two highest scoring grounds are automatically in the Provincial competitions.

The local competition is judged twice during the summer, at dates named by the Society, usually the first week in July and the second week in August, by a panel of three judges also named by the Society. The agricultural representative usually acts as one of the judges.

The Rural Municipality of Dauphin present their trophy annually to the local winner, a cash prize donated by an interested party also accompanies the trophy. In order to create new interest, the winner of the trophy is not eligible to re-enter the local competition for the following three years, but may enter each year for the Provincial honors. On winning the Provincial honors for two successive years, they are automatically disqualified for one year.

All competitors in the local competition must reside in the Dauphin Municipality.

There is no entry fee but competitors are asked to buy a one-dollar membership ticket which admits them to the annual horticultural show in August and also gives them three free entries in the show.

Rules and regulations covering Provincial Home Grounds Competition:

1. Farm Home Grounds should include house yard, shelter belts, fruit plantings, vegetable garden, lawns, ornamental plantings and general orderliness of the farm yard.

2. Grand championship trophy will be awarded to the best "Farm Home Grounds." Individual prizes and certificates will be awarded to winners of both classes and to the grand champion.

Class 1 — Farms over five acres and up to one-quarter section.

Class 2 — Farms over one-quarter section.

3. (a) The Manitoba Horticultural Association will look after the final scoring only.

(b) Entries will be received in the Provincial competition from any agricultural or horticultural societies or alternatively where there is no such society, from any other responsible organization, service club, Chamber of Commerce, women's institutes, etc. This organization must be responsible for any preliminary eliminations. Entries made by individuals are not accepted for the Provincial competitions.

(c) Entries for the Provincial competition will be received up to July 31st.

Following are the scoring points as used in both Provincial and local competitions:

(a) General plan or layout (overall picture of orderliness) 20.

(b) Plantings — protective and ornamental (shelter belts, border, foundation) 25.

(c) Utility plantings (vegetables and fruit) 25.

(d) Decorative plantings (annuals, perennials, biennials and specimen plantings) 15.

(e) Lawn (living out area and special features) 15.

In concluding my outline of the rural competitions, may I say that these competitions are not difficult, they just call for a little foresight and planning plus attention. Even if you do not reach the goal for a few years, we need your interest and co-operation in order to make our communities a better and more attractive place in which to live, so support your local horticultural society and help us to help you. When the annual show comes around, we would like you to say: "I know what I saw," and "I'll show what I grow."

The urban competitions under the direction of Mr. E. F. Troendle, a long standing director of the Dauphin Society, have made progress during the past two years, particularly in the number of entries, appearance, layout, and types of material used.

There are several competitions in the urban set-up for which trophies and prizes are given. This is necessary because of the varied sizes and types of home grounds about town.

Provincial competition is also evident here. In 1949, Mr. D. E. McLean was successful in bringing Provincial honors to Dauphin with his home grounds in lots 34'-66' size.

Following is a listing of the trophies offered in the following competitions.

The Town of Dauphin Trophy — for the best landscaped design on lot less than 100-foot frontage.

Mayor Bullmore Cup — for best kept home grounds, back lane and boulevard as well as lawn, vegetable and flower garden.

Horticultural Society Trophy — to home owner who has made the best progress in beautifying grounds around homes built in the past three years in town of Dauphin or adjoining sub-divisions.

Sneath Trophy — for best kept home grounds of half an acre up to 5 acres open to veterans only in Dauphin town and rural municipality — boulevard, lawns, vegetable and flower gardens to be considered.

The judging is completed in the same manner as the rural competitions, namely by a panel of three judges twice during the summer. However, the score cards are somewhat different and read as follows:

- (a) General plan and layout, 20.
- (b) Plant material, variety and condition, 25.
- (c) Appearance and up-keep, 25.
- (d) Practical value to the occupier, 15.
- (e) Suitable garden features, 5.

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Perennial Patter

HAROLD HARRIS

WINNIPEG

"Perennials! Oh, they are the plants that come up every year and you don't need to bother with them," many people will say when gardening for the first time. On the contrary, while being quite hardy, perennials do need care if they are to be kept in a healthy condition and give a good showing of flowers.

In growing perennials I have had good success starting the seeds indoors in pots very early in the spring. I have no greenhouse, but a number of years ago built a sunroom on the south end of my home primarily for growing plants of all kinds. When the seeds are well started, I transplant into flats where they remain until put into cold frames outside, and then into the garden. Incidentally, when buying seed, always order the best as it is good economy. The soil is the usual mixture of potting soil.

If you haven't the facilities for growing your plants from seed, or can't wait for results, then you had better buy plants or roots from a reliable nursery or see some of your friends who are gardeners. You will find that a true gardener will only be too pleased to help anyone interested in growing plants and you will always go home with plants or cuttings of something.

With perennials, a few thoughts to bear in mind are location, room for growth, color, blooming period. A southern exposure is best for most perennials although, in my garden, I found perennial phlox did best planted at the side of the house with a western exposure, the bloom lasted much longer and did not fade. Some of the more common perennials that are sun lovers are Achillea (Perry's white), Aconitum (Monkshood), Carpathian Harebell, Peach leaved Harebell, Snow-in-summer, Delphinium, Gas Plant, Gaillardia, Baby's Breath, Day Lily, Iris Germanica, Iris Siberica, Tiger Lily, Statice, Lychnis, Iceland Poppy, Oriental Poppy, Peony, Bouncing Bet (beware of this one as it spreads readily), Hen and Chickens, Painted Daisy, and climbers such as Clematis. In my garden I have Clematis (Skinner's have this Macropetals) that is semi double, blue with yellow centre, and does not winter kill. The vine is now approximately 12 feet high on the trellis and last year bloomed in the fall as well as in mid-summer.

Perennials that do well in shaded locations are Aconitum (Monkshood), Carpathian Harebell, Lily of the Valley, Bleeding Heart, Sweet Rocket, Lythrum, Forget-Me-Not, and Day Lillies.

All plants need proper space for growth, especially certain types of perennials. Delphinium, for instance, grow very tall and also will spread over quite a large area if not controlled; they need air space as they suffer from mildew if crowded around the base. After blooming, seeds should be cut off unless wanted for friends, but if cut back after blooming, a second crop of flowers can be grown. Perennial geranium and painted daisy will spread also, so seed pods should be cut otherwise the clump will increase owing to seeds dropping and germinating quickly. Lilies should have overhead room, otherwise they will not grow erect as nature intended them to. Shorter growing perennials should not be crowded out with taller growing perennials or annuals.

Color in the garden, to some people, is a very precise object. In these cases, a definite pattern is generally the result. Personally, I believe all colors in plants go very well together if massed in groups and in this way a much more pleasing, natural arrangement is achieved. After all, can we improve on nature? She has been much longer in the business than we gardeners.

Perennials are divided into three classes regarding blooming periods, i.e., early, mid-summer, late summer.

The early blooming are: Snow-in-Summer, Iris, Iceland Poppy, Peony, Oriental Poppy, Pink Moss Phlox, Lily-of-the-Valley, Scillas, Tulips and Pyrethrum.

Midsummer: Achillea, Monkshood, Carpathian Harebell, Peach-Leaved Harebell, Gas Plant, Gaillardia, Day Lily, Lychnis, Iceland Poppy, Oriental Poppy, Ada Black Jack Phlox, and Lythrum.

Late summer: Baby's Breath, Tiger Lily, Statice, Golden Glow, Lythrum and Rudbeckia (Cone flower).

From the above list you will see perennials will give color to the garden throughout the growing season. There are many more you could add to your garden but these are the commonest. Incidentally, these are the ones I have in my small garden.

When preparing your place in the garden for perennials, bear this in mind: They are going to remain in this spot permanently so the ground should be thoroughly dug, mixing it with a two-inch layer of well rotted manure or with a good commercial fertilizer, along with ten pounds of bonemeal per one hundred square feet to give it a well balanced source of available plant food.

After plants are well established, watering is very important. Do not give them light sprinklings every day, this only wets foliage and if done in the evenings tends to contribute to fungous diseases. When watering, do a thorough job

around the base of the plant and do not water until they definitely need it. Morning watering is best.

When plants have grown large the clumps can be carefully divided and reset. This is also a good time to clean out grass roots and weeds which have a bad tendency to grow around the base of the plants. Oriental Poppy and Baby's Breath have to be divided very carefully owing to the large tap root they develop; they can be better propagated by stolons or shoots. The best time to take cuttings is in the spring when parent plants are about six inches high. Root cuttings are best taken mid summer or late summer when they will grow into good plants the following spring.

Winter protection of perennials should be put on only when the ground is frozen, the reason for this being to keep the ground cold until spring is well set in and this prevents the ground from alternately thawing and freezing, then heaving the plants and dislodging the roots, especially young plants. The mulch should be light so as not to smother the plants. Corn stalks or good straw manure or old sweet pea vines are good for this.

With careful selection and arrangement of perennials, the garden can be assured of a continuous change of color from early spring until fall and, because of this, an ever changing picture of a perennial border and background can become a definite feature that will add beauty to the home grounds.

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There is a wide selection of shrubs suitable for Prairie conditions. The Manitoba Horticultural Association lists some fifty varieties, and our nurserymen catalog most of them.

Shrubs are an important feature in landscape plans, they are the framework on which the plan is built. In winter as well as summer, they provide an attractive setting for homes and other buildings, they provide shelter at all seasons, and add colour to the scene with bloom in summer, colourful leaves and fruit in fall, and many carry fruit and coloured branches through the winter months.

There are shrubs only a few inches high for rock gardens, and all sizes upwards to twenty feet. There are shrubs of various habit, trailing, spreading, compact, loose branched, upright in growth, and some more or less pendulous. There are shrubs for dry locations and others for damp soil, some like full sun and there are a few that do well in shade, in fact, a suitable shrub can be found for most locations.

When planting shrubs, careful consideration must be given to the choice of plant for each location. In public and private plantings, well chosen shrubs are the exception rather than the rule. A common mistake is not allowing enough room for shrubs to develop naturally, this is especially noticeable in group plantings. A shrub that has to be severely pruned to keep it within bounds loses its natural grace and beauty.

Speaking of pruning, most of our hardy shrubs require very little pruning, but once a year, preferably in spring, shrubs should be checked over and any pruning should be attended to. Shrubs consist of a root system below ground and several stems above ground. Shrub roots live for a long time but the stems above ground die off from time to time and new stems spring up to take their place, usually a shrub produces too many new stems and the bush gets too dense for healthy growth, resulting in weak spindly wood. Pruning out dead and weak branches and thinning out the surplus young stems will keep the shrub thrifty. Cut the stems down to ground level, don't leave stubs, where part of a branch has to be removed, cut the stem or branch just above a bud. When the old, dead, and surplus wood has been removed, prune out any branches that may spoil the symmetry of the bush. A few strong healthy stems are far better than a thick clump of weak, sickly growth.

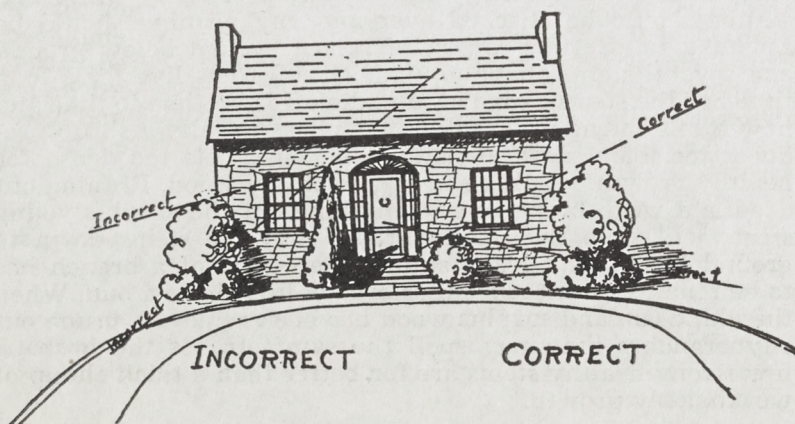
Established hardy shrubs seldom need to be watered, occasionally, in very dry weather, a good soaking may be required. Cultivation may be confined to keeping weeds in check, digging close to the shrub is not recommended as the feeding roots on most of our shrubs are close to the surface, a light hoeing to control weeds is all that is required. If the ground is very dry at freeze up, a good soaking just before the ground freezes is beneficial, especially for evergreens. Much of our winter kill is caused by dehydration.

Guard against insect damage by spraying or dusting regularly, especially after rain storms. Malathion is a good all-around insecticide and will take care of most harmful insects. Mildews and other fungi can be checked by dusting with powdered sulphur. Lack of pruning when the plant gets too dense results in poor circulation of air and therefore contributes to fungus attacks.

Transplanting can be done either in fall when the leaves are falling or in spring just before the leaves appear, the plant survives the operation much better when dormant. Never leave the root system exposed to the air, keep the roots moist at all times, the hair-like feeding roots dry up very quickly if exposed to dry air. Dig a hole large enough and deep enough to accommodate the roots comfortably, be sure the plant is as deep in the soil as it was before moving. Fill the hole half full of soil, firm it down with the heel, then fill up the hole with water, when it soaks away, level off the soil.

When purchasing shrubs, get fresh dug, healthy stock from prairie nurseries.

The recommended Horticultural Varieties list of the Manitoba Horticultural Association is an excellent guide in choosing varieties and nurserymen's catalogues are very helpful.



Budding

W. SHELMERDINE

Shelmerdine Nursery, Charleswood, Man.

In drafting this article, the writer has, for the sake of clarity and brevity, followed a straight path to the heart of the subject. This has resulted in leaving out explanations of seldom used techniques which, after all, are only variations to one end.

We know that grafting of plants has been practiced for over 2,000 years. Pliny wrote of it as being commonly done in his day. It is only in the last 100 years that the methods of grafting have been available to everyone. Before this time, they were kept as trade secrets.

When we plant an annual vegetable or flower seed we may expect to get vegetables and flowers practically the same as the parents which produced the seed. We say that such seed is "fixed." However, when we plant the seeds of any of our woody fruit plants or ornamental shrubs we usually get something quite different from the parent. We say that the seed does not come true.

Therefore, if we wish to reproduce a fruit plant, say, of a certain variety and having exactly the same characteristics, we have to take a piece of its tissue and grow the new plant from it. We can take a short piece of the stem, commonly called a cutting, and insert it in a soil mixture, and, given proper conditions, cause it to root and develop into a new plant. Examples of plants grown in this way are currants and willows.

However, certain plants such as apples, plums, cherries and so on are so difficult to propagate in this manner that an entirely different approach, called grafting, is employed. This consists of fastening a small piece of the desired variety to another tree (which is usually grown from a seed and is therefore called a seedling). This small piece grows and forms the upper part of the tree and is in turn nurtured by the seedling root.

Each part of the tree, the so-called "tame" top and the wild root, retain their identity. That is to say, the top part bears exactly the same kind of fruit as the tree from which the small part was taken and the root continues to be wild. This, incidentally, explains why it is necessary to remove any suckers which grow from below the graft. In addition to being useless, these suckers, if allowed to grow, choke out the good part of the tree.

The commonest, easiest and speediest form of grafting is called budding. With this method we use only the bud as explained later. In the west, budding is done at two seasons of the year, approximately May 15, and again about July 20th.

For May budding, stems of the past year's growth, each about ten inches long, are collected from bearing trees towards the end of March. These stems or scions (pronounced syons) are tied into bundles, one variety to a bundle, wrapped in damp moss with an outer covering of wax paper and stored in a refrigerator, root cellar or ice house. About May 15, these scions are taken to the field and budded to seedling trees. If done successfully, they begin to grow almost immediately.

By far, the commonest and most successful budding is done in July. At this time, the scions are removed from the parent trees in small quantities and used immediately. This is called dormant budding because the bud does not usually grow until the following spring.

Again, the most popular way of performing the July budding is the T or shield budding method. The equipment required is quite simple. We have a box similar to, but about half the width of a plant flat. In this we carry an ordinary pocketknife, a well-sharpened budding knife, a sharpening stone, a box of rubber strips each about four inches long, and a wax lamp made of a quart paint can in which is suspended a smaller can containing ordinary parafin wax and a small paint brush. Below the small can is a small coal oil lamp to melt the wax. The rest of the space in the box is occupied by damp moss in which are buried the scions.

The ideal size of seedling or host tree to be budded is about as thick as a lead pencil at the base. The branches are first trimmed off the lower six inches of the trunk. About an inch and a half above the ground level a horizontal incision is made just through the bark and about one third the distance around the trunk. Next, a perpendicular incision is made from the centre of the first incision down the trunk about three quarters of an inch. Thus, we have cut through the bark to form a T.

Next, the bud is removed from the scion with a very sharp knife by taking a thin oval or shield of the bark and wood. This bud shield is inserted into the cross of the T and pushed down so that it is almost completely covered by the bark of the host tree. The bud is then secured by wrapping budding elastic over the wound, being careful to avoid having it cross directly over the bud itself.

Some of the melted parawax is brushed over the whole face of the wound to prevent it from drying out before the bud knits to the host tree. The proper budding rubber rots in about three weeks and thus saves the labor of cutting it. The bud remains dormant until the following spring.

In March or early April, the seedling tree is cut off just above where the bud was inserted. When the growing season starts, the bud also commences to grow. It is necessary to brush off all the other growing buds as they appear to encourage the rapid growth of the inserted bud. Usually, this bud develops into a single stem or whip about three feet high in a single season.

An excellent folder is available from the Publications Branch Department of Agriculture, Ottawa, for those interested in greater detail than an article of this kind affords. The title of the publication is "The Budding and Grafting of Fruit Trees." It is profusely illustrated and is one of the best expositions of the subject that the writer has seen.

Care of Evergreens

Winter injury can damage your evergreens. In fact, it is probably the number one cause for evergreen failures. Reddening and browning of the needle tips which appear in the spring or as late as midsummer, followed by an unthrifty condition and death of branches is often caused by winter injury.

The most common type of winter injury of evergreens is NOT caused by low temperatures and freezing of tissues, but rather by the drying out of leaf tissues because of undue evaporation of moisture. Dry winds and periods of unseasonably high temperatures with intense sunlight cause an excess loss of water by evaporation. If this condition occurs at a time when the soil is frozen or when the roots are still dormant, sufficient water cannot be absorbed by the roots to replace that loss by evaporation.

Evergreen plantings should be adequately watered as cold weather approaches, so the plants can go into the winter with a good supply of moisture. During the first few years after planting, if the plants have not been mulched through the summer, it is best to put 2 or 3 inches of peat moss around the trunk area in the early winter. Then, after the ground is frozen, place 6 to 10 inches of leaves or straw around the plants. This should be done around all plants in sections where winter injury is probable. Newly planted evergreens in locations exposed to prevailing winds or to intense sunlight should be protected during the winter by burlap or some other means.

Don't neglect your evergreens. A few minutes spent in providing the proper protection will preserve and keep the beauty they add to your home landscape.

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Plant Protectors for your Garden Crops

V. W. NUTTALL

Horticulturist, Vegetable Crops

Experimental Station, Morden, Manitoba

The idea of using protectors for heat-loving plants is not new. They have been used in various forms for many years. Recall the "tomato cans" with tops and bottoms removed, the wooden shingles and the paper bands that have been placed around tender tomato plants to protect against hot sun, wind and rain, and destructive insects.

In keeping with the changing times, plant protectors today are manufactured commercially and in large numbers. Designed to completely cover the plant, yet permit the passage of light and air, they are easy to handle and economical to buy. The most commonly used plant protectors today will be familiar to the gardening public under the names of "hotkap" and "hotent." They are constructed of a specially prepared waxed paper and are reinforced to prevent collapse. When placed over the plant, they can be anchored to the soil sufficiently well to withstand the impact of strong winds and slashing rain.

Hotkaps are cone-shaped, measure about 11 inches across at the base and are practically self-supporting. Hotents are rectangular at the base and are available in two sizes, one covering 152 square inches and the other 255 square inches. The larger protector is called the super-hotent and stands 11 inches in height, being 2 inches higher than the standard. Both are adequately supported by lightweight bows.

Plant protectors serve many useful purposes in the garden and account in part for much success met with by the more progressive gardeners. They serve to lengthen the growing season and in so doing invariably increase vegetable yields. These are important factors for consideration in the short season areas common to all the prairie region. Plant protectors guard against damage from insects and birds, protect against winds and pounding rains and shield plants from frosts which frequently occur for short duration in the late spring. They aid in preventing drying and baking of the soil around the plant and thus substitute for a mulch. The accumulation of heat and the maintenance of high humidity beneath them are beneficial to rapid plant development. In an open garden plot, it is considered that plant protectors shield the plant to some measure from drifts of weed killers such as 2,4-D.

Tomatoes, peppers and melons respond well to culture under plant protectors. All can be safely transplanted in the garden two to three weeks in advance of the normal date for transplanting, provided they are protected at the time of setting out. Earlier transplanting does not imply a necessity for earlier seeding indoors. On the contrary, smaller but sturdier plants thrive better under paper protectors than do tall spindly overgrown plants.

Occasionally, it is observed that there is little or no plant development by way of visible increase in size for a week or more following transplanting to the garden and covering with protectors. This can be expected if the weather remains cool and cloudy, but it should not be a source of discouragement to gardeners. Though the small plants appear to be "standing still" they are becoming established and are slowly producing an extensive root system. When the weather warms up, the plants make luxurious growth. In this way, protected plants set out early are much ahead in development of the unprotected plants set out at the normal time.

For placing out under paper protectors, it is suggested that tomatoes be seeded indoors no earlier than April 12-15. Peppers can be started about 10 days earlier for they are slower growing. Melons should not be started indoors earlier than the end of April or beginning of May. It is also quite satisfactory to plant melon seed outdoors by May 20, providing there has been some warming of the soil. The hills should be covered immediately with the large paper protectors. Tomatoes will develop satisfactorily under hotkaps but respond better to hotent protection where they are not so confined. Melons do best under large protectors and actually commence vining and flowering before being completely exposed to the elements of the weather.

When placing the protector over the plant, do not first make a depression in the soil. By means of a "setter" hold the paper protector in position and draw up sufficient soil to anchor it to the ground. Lumpy soil should be avoided since the lumps aid in collapsing the protectors, especially after the paper becomes weathered by dew or rain. Furthermore, lumps of soil indent the wall of the protectors, thus considerably reducing the capacity beneath which is to the detriment of plant growth.

Plant protectors are, in effect, miniature greenhouses. Care is required that plants under them do not become overheated or too succulent. Thus, much consideration must be given to ventilating at the proper time. One experimenter found that when temperature of the air was 90 degrees Fahrenheit, the air temperature beneath the hotkaps was 14 degrees higher. This higher temperature can be injurious to the plant if exposure is for an indefinite period. As soon as day tempera-

tures persistently go up to high levels, the protectors should be ventilated. With the aid of a penknife a V-shaped cut, three inches deep should be made in the side or end which is exposed to the sun. The triangular flap provided by this cut can be folded in to allow for free exchange of air. During periods of prolonged cool, cloudy weather, the opening should be closed simply by pulling the flap back into position. The process of ventilating the paper protectors is not tedious but is one of the major items contributing to success in their being wisely used.

With some care, paper plant protectors can be removed and stored for use another season. This should not be done until the gardener is assured all risk of cold spring weather is past. A practical and very satisfactory procedure is to leave the protectors in position until early summer or all season if they do not become too untidy in appearance. For tomatoes or peppers, a hole can be cut or torn in the top of the "cap" or "tent," thus allowing the plant to grow through. The hole should be made before the top leaves of the plant reach the top of the protector. Neither should the opening be made full size in the first operation but should be enlarged gradually, perhaps once a week, depending on the rate of plant development. For melons, the ventilation hole on one side can be gradually enlarged and by making a similar hole on the other side vines can extend out through both openings. These steps provide for a gradual exposure of the somewhat tender plant to the elements of the weather and can be considered equivalent to a "hardening-off" process, a practice which is essential before greenhouse-grown plants can be shifted to the outdoors.

The effect of plant protectors on plant growth is, at times, amazing to observe and is of much more interest to the gardener provided a few unprotected plants of the same kind are grown for comparison. There is less setback from transplanting shock when plant protectors are used. Plants have been observed to flower earlier, set fruit earlier and produce mature fruit earlier and in greater quantities. A few results from cultural studies made at the Morden Experimental Station are presented to support the foregoing statements. Under conditions at Morden for the past number of years, tomato plants set in the garden May 15-18 and protected with hotents have yielded two to four times as much as those plants which were set out June 3-8 and left unprotected. Hotent-protected muskmelon transplants bloomed 14 days earlier and produced mature fruit 17 days earlier than the unprotected plants. By setting muskmelon plants in the garden around May 28 and covering with hotents, ripe melons were obtained three weeks earlier than from plants produced from direct seeding in the garden and left unprotected. Many other beneficial effects of plant protectors have been observed.

A form of plant protector which is apparently finding favour with gardeners in the east and west but which is comparatively new to prairie Canada is the glass cloche. It is the most commonly used plant protector in England and has made possible the production of tomatoes and other heat-loving crops outdoors in that country. The cloche construction consists of two or four rectangular sections of glass held firmly by shaped galvanized wires which are readily assembled into an efficient supporting frame. These glass plant protectors are aptly termed portable miniature greenhouses. They can be assembled into a "continuous cloche greenhouse" by simply placing the cloches end to end. Ten cloches placed in such a manner will produce a 15-foot greenhouse. The forms of the cloche vary slightly according to the crop for which they are to be used. They are readily ventilated from ends, top or side as required. It is a simple matter to transport them from one position to another and they are readily dismantled for cleaning and storage when not in use. Cloches are anchored to the ground by virtue of their weight and form.

A brief study was made at the Morden Experimental Station, in 1954, of cloche culture of tomatoes and muskmelons. Plants of both crops made excellent growth and bloomed remarkably early. Because muskmelons are dependent upon bees for good pollination, the "continuous greenhouse" had to be opened up. Cloches were spread apart by 8 inches to allow insects to enter. Ripe melons were picked from the cloche-protected plants on August 25 and by September 2, twelve ripe fruits, weighing 22 pounds, were harvested. It was not until September 2 that the first ripe fruit was picked from an equal number of plants of the same variety but which had received no protection. It is presumed that fruit ripening was stimulated by the presence of the glass as the cloches were left in the spread-out position all season.

The cloche appeared to stimulate profuse branching in tomato plants and accompanying this effect was an extraordinary large fruit set. Four plants protected by a continuous cloche greenhouse yielded 316 fruits weighing 65 pounds. Four other plants of the same variety and transplanted at the same time but not given cloche protection, yielded only 124 fruits weighing 35 pounds. Associated with the large number of fruits on the cloche-protected plants was a smaller size. The fruits on the non-protected plants were one ounce greater in weight. It is obvious that a smaller fruit size was more than offset by total yield from the cloche protected plants.

Although only a few crops favoured by plant protectors have been discussed, it should be pointed out that many more crops likewise benefit. Information pertaining to such will be released as soon as it is available for publication. In England, culture of both flowers and every common vegetable

under cloches is a year-round proposition with many home gardeners as well as with commercial growers.

It is presumed, from the discussion which has preceded, the reader will see that the limitations of all plant protectors are quite obvious. In this particular section of the country, it is found they are of value in getting some of the warm weather crops off to an earlier start, in hastening maturity, and in increasing yields. It cannot be over-emphasized that all plant protectors must be handled very wisely with special care being given to ventilation at the proper time.

Although paper protectors can be used for more than one season, the small expense involved in the purchase of a few each year is more than offset by the advantage gained therefrom. They are procurable from all firms who sell seed or garden supplies. The glass cloche is also available in Canada. For those who are further interested, information is available from The Chase Company of England, P.O. Box 234, Victoria, British Columbia.

Brandon Horticultural Society

HISTORICAL BACKGROUND

The Brandon Horticultural Society was inaugurated in the year 1893 by a group of men who were thinking in terms of beautifying the locality which is now known as the City of Brandon. It was the first Society of this kind in Manitoba and was incorporated under the name "The Brandon Horticultural and Western Forestry Society". Application was made on the 1st day of March 1893 and a Certificate of Organization was signed on the 9th of May 1923 by R. Cameron, then Minister of Agriculture and Immigration. Appearing on the first Certificate are the Officers as follows: Hon. Pres. J. N. Kirchoffer; Pres. F. Hesson; Sec. H. O. Boger; Treas. D. H. Scott; G. R. Coldwell, T. M. Percival, R. M. Matheson, H. L. Patmore, D. Shirriff, Peter Middleton, W. Shillinglaw.

The Official Documents are deposited with the Manitoba Government, Department of Agriculture. It was due to the efforts of these men whose names are shown on this Certificate that Brandon became noted for its fine boulevards and shade trees. Later the original name, being considered unwieldly, it was changed to "The Brandon Horticultural Society". Since that time Horticulture generally, throughout Manitoba and Western Canada, has made tremendous advances, but Manitoba owes its first interest in this matter to prominent men of the early days of Brandon who spear-headed the movement.

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House Plant Problems

From frost to spring, it's the indoor gardening season. And as often as this season rolls around there are a number of troubles and problems that face the indoor gardener. Here are the answers to some of those problems.

WASHING HOUSE PLANTS . . . Glossy-leaved plants profit from a weekly spraying or sponging. Soapy water is beneficial for washing when red spiders, scales and certain other insects are present. Fuzzy or hairy leaved plants should be dusted with a soft brush, not washed.

BUD DROP . . . Drying-up and dropping of buds on plants with dark green foliage is quite common. This condition is usually caused by either a high temperature, irregular or too heavy watering, or by gas fumes.

LEAVING HOUSE PLANTS DURING A VACATION — A week or 10 days without water may damage your plants. Water the plants good and place in a box, setting the pots in saucers or pans of water. Pack wet paper or peatmoss around the pots. If the house will be unheated or the thermostat set low, be sure the plants are placed where they will not freeze.

HOUSE PLANT CONTAINERS WITHOUT DRAINAGE HOLES . . . Containers without drainage or vents at the bottom (such as table lamps with a basin for house plants) will soon cause a soil compaction and a soil condition that will not permit proper plant growth. If not carefully watered, air is driven out of the soil . . . and air in the soil is as important to plant growth as air to your own well-being. However, with care in watering Ivies, Saintpaulias (African Violets) and Cacti, plants may be kept in good growing condition without drainage vents. In this case add water only when the soil is dry on the surface and then use enough to saturate the soil root ball. Tip the container and pour off excess water. Do not water too often.

ELECTRIC LIGHTS . . . During dark winter days when there is no sunlight, electric lights may be used as a substitute. Growth under artificial light cannot be expected to be equal to that under natural conditions, but you can keep plants green and growing by supplementing with artificial light.

SOIL STERILIZATION . . . With the increasing presence of plant diseases and soil insects, it is most always advisable to sterilize new potting soil. The simplest method for small amounts is to place the soil in a shallow pan and put in the kitchen oven for 20 minutes at a temperature of 180 degrees. Higher temperatures should be avoided so not to burn up the

organic matter. Another method said to give satisfactory results is to pour boiling water over the new potting soil, cover with burlap and let stand for 24 hours. Then uncover and stir to incorporate air with the soil. Let the soil dry until it is in a workable condition.

PLANT FUMIGATION . . . We usually think of fumigation as a control measure that can be used only in greenhouses and in air-tight places. However, mites and some other infestations of house plants can often be easily controlled by a simple home fumigation. Place the plants in a tight bureau drawer or in a cardboard box with a cover, include about 5 moth balls for each 4-inch pot. Let plants stay in such an enclosure for 24 hours. Meanwhile sterilize the saucers, watering pots and shelves in boiling water.

WHITE MOLD-LIKE SUBSTANCE ON THE OUTSIDE OF CLAY POTS . . . This film is alkali from the soil and water. Wipe the pots occasionally with a soapy cloth. Use a wire brush if necessary. Empty pots may be left out-of-doors during the winter . . . the freezing and thawing will do a better job of cleaning than you can.

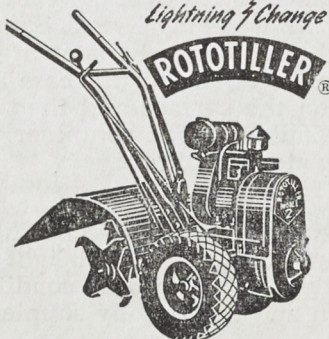
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Classification of Annual Flowers for the Home Garden

DR. W. R. LESLIE

Superintendent, Dominion Experimental Station

Morden, Man.

Twelve Annuals for Outside Sowing: *Calendula*, *Centaurea cyanus* (Cornflower) *Cosmos*, *Dimorphotheca* (Cape Marigold), *Eschscholzia* (California Poppy), *Godetia*, *Lathyrus* (Sweet Pea), *Lavatera*, *Papaver* (Poppy), *Portulaca*, *Reseda* (Mignonette), *Tropaeolum* (*Nasturtium*).

Annuals for Edging Beds and Borders: *Ageratum*, *Anagallis* (Pimpernel), *Antirrhinum* (Snapdragon), *Bellis* (English Daisy), *Dimorphotheca*, *Brachycome* (Swan River Daisy), *Eschscholzia*, *Gilia lutea* or *Leptosiphon roseus*, *Iberis* (Candy-tuft), *Lobelia*, *Lobularia* (Sweet Alyssum), *Nierembergia* (Cup-Flower), *Portulaca*, *Sedum caeruleum* (Blue Stonecrop), *Tagetes*, *Tropaeolum* (Dwarf *Nasturtium*), *Viola* (Pansy), *Zinnia linearis*.

Climbers to grow on supports: *Cobaea scandens* (Cup and Saucer Vine), *Cucurbita* (Yellow-flowered Gourds), *Dolichos* (Hyacinth Bean), *Echinocystis* (Wild Cucumber), *Ipomoea* (Morning Glory), *Lagenaria* (White-flowered Gourd), *Lathyrus* (Sweet Pea), *Tropaeolum majus* (*Nasturtium*).

Fragrant Annuals: *Centaurea moschata* (Sweet Sultan), *Chenopodium botrys* (Ambrosia), *Heliotropium* (Heliotrope), *Lathyrus*, *Lobularia*, *Matthiola annua* (Ten-Weeks Stocks), *Matthiola bicornis* (Night-Scented Stocks), *Nicotiana alata* (Winged Tobacco), *Petunia*, *Phlox drummondii* (Annual Phlox), *Mignonette*, *Verbena*.

Foliage Annuals: *Amaranthus* (Amaranth), *Artemisia* (Summer Fir), *Centaurea gymnocarpa* (Dusty Miller), *Chrysanthemum*, *Kochia*, *Perilla*, *Ricinus* (Castorbean).

Everlastings: *Ammobium alatum* (Winged Everlasting), *Cotananche coerulea* (Cupidsdart), *Gomphrena* (Globe Amaranth), *Gypsophila* (Babys-breath), *Helipterum* (Rhodanthe), *Helichrysum* (Strawflower), *Limonium* (Statice), *Xeranthemum* (Immortelle).

CUT FLOWERS: *Antirrhinum* (Snapdragon), *Brachycome* (Swan River Daisy), *Browallia*, *Calendula*, *Callistephus* (China Aster), *Celosia* (Cockscomb), *Centaurea* (Cornflower and Sweet Sultan), *Chrysanthemum*, *Clarkia*, *Coreopsis* (Tickseed), *Cosmos*, *Dahlia*, *Delphinium* (Larkspur), *Dianthus* (Pink), *Dimorphotheca* (Cape-Marigold), *Gaillardia*, *Helianthus* (Sunflower),

Lathyrus (Sweet Pea), Lavatera, Mathiola (Stock), Nemesia, Papaver (Poppy), Phlox, Reseda (Mignonette), Rudbeckia (Annual Coneflower), Salpiglossis, Scabiosa (Scabious), Schizanthus (Butterfly-Flower), Tagetes (Marigold), Tropaeolum (Nasturtium), Verbena, Viola (Pansy), Zinnia, Ornamental Grasses.

Annuals tolerant to Partial Shade: Celosia, Clarkia, Cleome (Spider-flower), Coreopsis, Delphinium, Godetia, Iberis (Candytuft), Lobelia, Lobularia (Sweet Alyssum), Mirabilis (Four-o'clock), Nicotiana (Tobacco), Oenothera drummondii (Drummond Evening Primrose), Phacelia, Phlox, Verbena, Viola.

Annuals for Dry Situations: Brachycome, Browallia, Calendula, Celosia, Centaurea cyanus (Cornflower), Centaurea moschata (Sweet Sultan), Coreopsis, Dimorphotheca, Eschscholzia (California Poppy), Gaillardia, Helianthus, Nemesia, Nigella (Fennel-flower), Petunia, Portulaca, Sanvitalia, Sedum, Tagetes, Tropaeolum (Nasturtium), and Everlastings.

Annuals for Window Boxes: Antirrhinum Dwarf, Centaurea cineraria (Dusty Miller), Centaurea gymnocarpa (Velvet Centaurea), Lobelia, Lobularia (Sweet Alyssum), Petunia, Phlox, Reseda (Mignonette), Nasturtium, Verbena, Viola (Pansy), Zinnia Pompon.

Annuals that Self-Sow: Amaranthus, Calendula, Coreopsis, Cosmos, Delphinium, Eschscholzia, Helianthus, Kochia, Lobularia (Sweet Alyssum), Nicotiana, Papaver (Poppy), Portulaca, Reseda (Mignonette), Silene.

Annuals for Beds: Antirrhinum, Celosia plumosa, Dahlia Dwarf, Petunia, Phlox, Tagetes, Verbena, Viola, Zinnia.

Some Ornamental Grasses (Useful in winter bouquets): Agrostis nebulosa (Cloud Grass), Briza maxima (Great Quaking Grass), Eragrostis tenella (Love Grass), Pennisetum ruppelii (Purple Fountain Grass), Pennisetum villosum (Feather Top), Tricholaena rosea (Ruby Grass).

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Wild Flowers

Dominion Experimental Station, Morden, Manitoba

Wild flowers are among the wonderful gifts of Nature. They deck the landscape in woodland, hillside, meadow and swamp. Most unfortunately, some of these beauties of the outdoors are becoming only memories due to ruthless picking and careless pulling of plants.

Among the wild flowers which should not be picked are: All orchids including Ladyslipper, Lilies, Pitcher Plants, Shooting Stars, Trilliums, Columbine, Prairie Mallow, Scarlet Gaura, Bunchberry, Dogwood, Bluebells, Water Lilies, Indian Pipe, Spotted Wintergreen, Anemone, Fringed Gentian, and Walking Ferns.

The following group of Wild Flowers may be picked in small measure **providing the roots are not disturbed**: Hepatica, Dogtooth Violet, Bloodroot, Ferns, Iris, Meadow Rue, Clematis, Wild Geranium, Marsh Marigold, Gaillardia, Marsh Pinks, Beard-tongue, Common Violets, Closed Gentian, Yellow Wood Sorrel, Solomon's Seal, Lupine, Meadowsweet, and Wild Roses.

Plants which may be picked freely include: Asters, Goldenrods, Sunflowers, Blazing Star, Morning Glory, Toadflax, Evening Primrose, Milkweed, Bergamot, Joe-pyeweed, Black-eyed Susan, Mullein, Yarrow, Cinquefoil, Vetches, Mustards, Buttercup, Wild Carrot, Daisy, Vervain, Dogbane, Everlasting, Golden Ragwort, Bouncing Bet, St. John's Wort, and Cattails. It is noted that these are considered more or less weedy.

All cutting of Wild Flowers should be with scissors or pocket-knife. Never pull them. Always leave the plant part of its flowers so that it may ripen seeds and perpetuate itself. Flowering and fruiting shrubs and trees may be relieved of a moderate portion of their side branches by severing them with a sharp knife. Breaking or tearing off the branch wrecks tissues and prevents healing of the wounds.

The Morden Experimental Station is establishing a number of the native flowers which possess distinctive charm. Some require partial shade and moist conditions. In transplanting, lift the subject with a large block of soil and provide conditions similar to those of its birthplace. Starting the plants from seed is the most considerate practice but is a slow process.

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Some Recent Insecticides and Their Use in the Home Grounds

A. G. ROBINSON

Department of Entomology, University of Manitoba

Each year one or two new insecticides appear on the shelves of local drug, hardware and department stores. Several years of research precede the recommendation of a chemical compound for insect control, and its registration by the Dominion Government under the Pest Control Products Act. The small-packaged insecticides in retail stores usually have a brand name or trade name, but somewhere on the label will be found the name and the percentage of the toxic material or materials present. When we read that the product contains 5% of a certain ingredient, we know that the other 95% is a diluent, either liquid or solid.

Insecticides as we purchase them may be either liquids or solids. The liquids may be emulsifiable concentrates which are added to water before application as a spray; or they may be solutions in some highly refined oil. Beware of using solutions on plants, because most of them contain kerosene and are intended for application to floors, walls, etc., not to plants. The solids may be wettable powders or dusts. Wettable powders are added to water and applied as sprays. Dusts are ready for use as you buy them.

Briefly then, decide whether you want to use a spray or a dust; most insecticides are sold in either liquid or powder form. Read the label carefully to see if the pest you wish to control is included in the claims. When you actually apply the insecticide follow carefully the directions on the label, observing all safety precautions. The information on the label was approved when the product was registered under the Pest Control Products Act.

Perhaps more perplexing to most home gardeners is the problem of what to use, because so many products have been registered in recent years. Bulletins and pamphlets are published by the federal and the provincial governments on control of most insect pests, and these are available to the public at no cost through the Department of Entomology at the University of Manitoba, or through other Extension services. All such publications are revised and brought up to date as new and better insecticides come on the market.

Our most recent, and perhaps most valuable, addition to available insecticides is malathion; it appeared in local retail stores in 1954. It is formulated as an emulsifiable concentrate, as wettable powder and as dust. It is safe to use on plants, and

relatively safe to humans when ordinary safety precautions are observed. It has an unpleasant odour, which rapidly disappears. It is particularly effective against soft-bodied insects such as aphids, scale insects, mealybugs, plant bugs, thrips, leafhoppers, and against spider mites. I believe that it will rapidly become one of the most useful insecticides in the home grounds. Indoors it is showing great promise in house fly control.

Both aldrin and dieldrin are very useful insecticides, but as yet they are not packaged in quantities sufficiently small for use in the home grounds. If there is sufficient demand for them in small quantities they will soon be available. Both are chlorinated hydrocarbons, with fairly long residual action. Most of the chlorinated hydrocarbons have this characteristic, and as a result should not be applied to fruit or vegetables during the last 3-4 weeks before harvest.

Both aldrin and dieldrin are poisonous to humans, but are quite safe to use if normal safety precautions are observed. Aldrin is useful against cutworms and grasshoppers, and recent tests show that it is promising for control of root maggots such as onion maggot and turnip maggot. Dieldrin is effective against cutworms, grasshoppers, plum curculio, potato flea beetles and Colorado potato beetles. Dieldrin is very effective also against ants. Tests at the University of Manitoba have shown it to be very effective against that persistent little household pest, the Pharaoh ant. It is quite probable that dieldrin will soon be as widely used at DDT and chlordane for many household pests such as ants, carpet beetles, cockroaches and silverfish.

Toxaphene is another chlorinated hydrocarbon. Its usefulness in home gardens is still undetermined and, like aldrin, it also usually is available only in bulk quantities. It is effective against Colorado potato beetles, armyworms, cutworms and grasshoppers.

The three insecticides of recent origin most commonly found available in small packages from local retailers are DDT, chlordane and lindane. The most useful of these in the home grounds is DDT. It was the first of the new organic insecticides, and one can state truthfully that it ushered in a new era in insect control. The advent of all our new synthetic organic insecticides greatly decreased the use of the old stand-bys, such as Paris green, the arsenicals, nicotine, pyrethrum and rotenone. While DDT has its limitations, it still is a very useful insecticide in the home grounds.

DDT is a most effective control for gladiolus thrips either on the growing plants or on the stored corms. It will kill most caterpillars or beetle larvae which eat foliage, namely, such pests as fall cankerworm, imported cabbageworm or Colorado

potato beetle. It is a good control for most plant bugs and leafhoppers. DDT is useful inside the house against many of the stored product pests. Combined with pyrethrum and an activator, in aerosol bombs, it is used to clear a room of flies and mosquitoes.

In the home grounds chlordane is perhaps most valuable against certain soil pests. As a dust or spray it will quickly rid the lawn of ants. It is reported to be effective against sowbugs, earthworms and millipedes. Inside the house chlordane is effective against ants, cockroaches, silverfish, carpet beetles and other household pests.

Benzene hexachloride was introduced commercially about the same time as DDT. It had a musty odour and tainted certain root crops. Chemists isolated the main toxic ingredient, the gamma isomer, and found that by the removal of impurities from the crude product much of the odour and tainting disappeared. This gamma isomer is known as lindane. It is not widely used in home grounds here in western Canada, mainly because other insecticides are perhaps more versatile. The chief use of lindane is in fly control, because it is more volatile than other chlorinated hydrocarbons. Thus we find it in many of the ingenious devices used in homes, restaurants and institutions where it is produced in a vapour or in a smoke.

Methoxychlor is very closely related to DDT, but is less toxic to humans and with less toxic residue on fruits and vegetables. It could be more widely used in home grounds against much the same pests as is DDT.

The "Pyrenones" have recently been introduced to our local market. One of the familiar brand names is "CPR", derived from the ingredients piperonyl cyclonene, pyrethrins and rotenone. These products are useful against insects eating foliage, particularly if you desire to harvest the fruit or vegetables in a few days.

The insecticides outlined above are most of those which have been introduced locally in recent years. No attempt has been made to give all their uses or limitations but specific recommendations may be found in bulletins and pamphlets for most of our economic pests.

One problem which merits a few further words is that of the respective merits of sprays and dusts. I personally prefer sprays, particularly for those insecticides which have a considerable residual toxicity. Many gardeners prefer dusts, because they are ready to use as purchased, and there is less bother in applying them, but I believe that a more satisfactory control of most pests, either indoors or outdoors, is obtained by using either emulsifiable concentrates or wettable powders in water as sprays.

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The dangers of "burning" and "killing" plants through excessive application or over-feeding of straight chemical fertilizers are of little concern to users of PRESTO, for with PRESTO it is almost impossible to ruin plants even if larger amounts than advised are used. For best results, however, we recommend that you follow directions on "How to Apply" which will be found in all containers. Copies of "How to Apply" will be mailed on request.

Packed in 5-pound Cartons; also 25 and 50-lb. Sacks.

The application of this Organic Base Fertilizer may be aptly described as a natural method of restoring the elements of which the soil has been depleted.

GUARANTEED ANALYSIS

Water Soluble Nitrogen	2.00%
Total Nitrogen	9.00%
Available Phosphoric Acid	7.00%
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Water Soluble Potash	4.00%

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Horticultural Notes

HECTOR MACDONALD

Assiniboine Park, Winnipeg, Man.

HOT CAPS FOR BEGONIAS

Five hundred Tuberous Begonias were planted under "Hot Caps" in the flower garden at Assiniboine Park, Winnipeg, on the tenth of May, 1954. The tubers were planted just as received from the Seed House. The "Hot Caps" were removed about the tenth of June when danger of frost was past. The result was most satisfactory, growth and bloom were better than similar plants started indoors.

Using "Hot Caps" saves indoor space, flats and pots, saves time and labour, and the plants are saved the shock of transplanting.

WINTERING ROSES

Last winter (1953-54), three methods of wintering roses were tried in Assiniboine Park. One-third of the H.T. and Floribunda Roses were dug and pitted, one-third were mounded with earth to a depth of six inches and then covered two feet deep with dry plant material, the remainder were covered with dry material without mounding. D.D.T. was liberally applied to all to prevent mouse damage.

In the spring, the pitted plants were in excellent shape but they made a very slow recovery from the effects of digging and replanting. Losses were heavy in the unmounded group and summer growth poor. In the mounded group, some of the weaker plants died but the remainder made excellent growth, bloomed early and made the best show. This winter (1954-55), all the roses are mounded. The value of dormant spraying for fungus control is being tested this year.

FLOWER SHOW POINTERS

Read the show rules.

Place exhibits in proper class or section.

Exhibit must have exact quantity or number called for.

Entry must conform to show regulations.

Quality gets top rating.

Uniformity rates high.

Eye-appeal is important.

Plant name tags is desirable.

Tight bunches of flowers lose out.

Try to keep each stem separate.

Insect damage or plant disease is not tolerated.

Blemishes of any sort lose points.

Freshness of bloom is most important.

You can't win if you don't enter.

"Warning All Gardeners"

G. S. REYCRAFT

That was the title of an article in last May's issue of Readers Digest. In part the article read:

"I never saw a better offer—so I sent the money and look! Disgustedly he showed me ten sad specimens."

How many of you have had the same experience?

Most garden-stock advertisers are honest and reliable. You should have every confidence in ordering from garden catalogues or advertisements. My warning is—distinguish the dishonest ad from the honest one.

I suggest you ask yourself a few questions such as:

1. Is the price ridiculously low compared with those quoted by nursery men of known reputation?
2. Is the specific size stated? If so, what is its significance? Is it nursery raised or a mere rooted cutting? If a bulb, remember 2½ to 3 inches in circumference, only gives you a mere bulblet under one inch across.
3. Is it a fancy name for some very common everyday plant?
4. Will it bloom or fruit, or even survive our Western winter? Hardy mums have been developed by careful selection, that will bloom on our Western prairies, but many others won't. Tulip trees may bloom on the West Coast or in Holland but don't expect them to survive here.

The number of plants, shrubs and trees that will flourish on our Western prairies is growing with every year. In almost all areas recommended variety lists are available free for the asking. Consult your provincial horticulturist, your horticultural society, or other competent authorities. They will be glad to advise you.

WATERPROOF WINDOW BOX WITH FOIL

When you start seedlings in a box in the house or on the window sill, shape aluminum foil around the outside of box to waterproof it.

Then your wife will not have to complain about muddy water running down the wall.

White paper placed upright at the back of the seedling box will reflect sunlight and eliminate the need for turning the box each day.

Brighten Up With Begonias

Have trouble with sun-loving annuals because your yard is too shady? Are you faced with a "northern exposure" problem? Then look to tuberous begonias — they thrive in partial shade. With their large, camellia-shaped blooms in brilliant reds, orange, yellow, and white, tuberous begonias illuminate shady spots as no other plant can.

Start good-sized (2-inch diameter) tubers **now** by spreading them out in a warm place. When little pink buds begin to show, place the tubers in a flat of well-moistened compost or peat moss, and fill in around them but do not cover them up.

Set the flat in a sunny window or hotbed and keep it moist. Soon you will see the leaves beginning to form. By May or early June, they will be ready to transplant into a bed well enriched with fertilizer. They demand a loose, open soil very high in organic matter, so work in quantities of compost or peat moss. By using hotcaps these plants may be set outdoors earlier, thus giving earlier blooms.

The tubers should be set about a half inch deep and eight or ten inches apart. To insure that the blooms will always be facing you, plant the begonias with the leaves pointing toward you. Total shade is not desirable; however, these colourful flowers do well on northern exposures that receive sunlight in the early morning or late afternoon.

Fibrous rooted or semperflorens begonias are covered all summer long with delicate red, pink or white flowers. They are low-growing and make fine border plants. Before fall frosts, individual plants may be lifted and brought inside to bloom all winter. If you already have a begonia semperflorens, new plants may be started now from cuttings set into vermiculite. However, young, started plants in 2-inch pots are available at most florists and are inexpensive.

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DAHLIAS

T. E. BABB

Members of the Dahlia family of plants (Compositae) furnish the ordinary home gardener with many of our worst weed as well as many of our most useful plants for decorative purposes.

Among the common weeds of this family are the Dandelion; Goatsbeard; Blue Lettuce; Prickly Lettuce; Canadian Thistle; Ragweed and Perennial Sow Thistle.

Cousins of the foregoing weeds grown by gardeners for their beauty are the Calendula; Calliopsis; Coreopsis; Aster; Heliopsis; Galillardia; Tansy; Cosmos; Marigold; Sunflower; Golden Glow; Chrysanthemum; Corn Flower (Bachelor's-button); Dahlia and others.

Some of the distinguishing features of this plant family are:

1. The blossom is composed of a number of florets (each a complete tiny flower) in a dense seed on a common receptacle which is the broad end of the flower stem. The base of these florets is protected by a circle of tiny leaflets called bracts which protect the florets within.

2. All the florets may be tubular but in many of the flower heads the outside row of florets is flattened. These flattened flowers, known as ray-flowers, are long and narrow. In the Sunflower, the long, narrow, bright yellow flowers around the margin are ray-flowers. The central florets in the flower head are called 'disc' flowers because together they look like a flat disc.

More and more people are growing Dahlias whose original home, in the wild state, was Mexico and South America. By hybridizing, man has greatly improved the wild Dahlia and has created many different types which cataloguers have classified. Hence, a knowledge of the terminology used by those putting out catalogues is necessary before making purchases.

A few of the more common varieties grown in classes are:

1. Formal Decorative

Double flowers having regularly arranged broad, pointed or rounded petals. A few examples are:

Pop Harris; Ike; Zest; White Fawn; Bride's Bouquet; Five Star General; Jeanette; Volcano; Lois Walcher; Mrs. Ida De Warner; Ambassadeur Van Kleffens; Francis Larocca; Lakeside Beauty; Shirley Westwell; Arthur Godfrey; Darcy Sainsbury; Gerrie Hoek; Links Blue Triumph; Pink Giant;

Helly Boudewijn; Monarch of the East; Queen City and Croydon Masterpiece.

2. Informal Decorative

Double flowers having twisted ray-flowers. A few examples are: Mrs. Hester Pape; Paddy; California Idol; Alice May; Freckles; Nobby's Light; Wosal; Murphy's Masterpiece; Kelvin; Sunburst; Croydon Glory; Hunts Velvet Wonder; Ken Luff; Autumn Blaze; Mrs. George L. Boutilier; Cherokee Brave; Bessie Hardress and Lord of Autumn.

3. Cactus

Double glowers with most of the ray-flowers rolled. This type is subdivided according to the way the ray-florets are rolled:

- a) Straight Cactus
- b) Incurved Cactus
- c) Semi-Cactus.

A few examples are:

Gretal; Abbot; Kings Size; Samba; Pink Flamingo; Marilyn Dale; Black Monarch; Faithful; Koki; Jane Lausche; Jean Trimbee; Michigan White; Virginia Rute; Silver Tips; All American; Lynn Fountain; Pride of Holland; Pygmalion; Rhythm; Nagels Orange; Yellow Special; Arabesque; Fernie Triumph; Mustang; Briosco; Audrey Muckle; Evelyn Chandler; Hilda Florette and Michigan Orange.

4. Ball

Double flowers definitely ball-shaped with regularly arranged petals. A few examples are:

Maud Adams; Jeep; Clara Clemens; Superintendent Amrhy and Charlotte Caldwell.

5. Pom-Pon

Double flowers similar to the ball type but much smaller. A few examples are:

Peach Blossom; Little David; Yellow Gem; Takas Purple; Doria; Honey; Betty Ann; Little Buddy; Dee Dee and Brown's Leo.

6. Semi-Single or Peony

Open-faced with two or three rows of petals in a circle around the margin of the flower head. An excellent example of this class is Bishop of Llandaff.

7. Single

Open-faced with one row of ray-florets. A few examples are: Coltness Gem; Temptation; Bachelor Girl and Garnet Poinsettia.

8. Miniatures

Types similar to the first three named classes but smaller.

Now for a few notes on the classes of Dahlias as outlined

in the Prize List of the Winnipeg Horticultural Society for the annual show next summer. Classes for exhibition are grouped as follows:

1. Blooms other than Cactus over 5-inches in diameter.
2. Blooms — Cactus type — over 5-inches in diameter.
3. Blooms other than Cactus under 5-inches in diameter.
4. Blooms — Cactus type — under 5-inches in diameter.
5. Ball.
6. Pom-Pon.
7. Bedding type.

Some points to follow when exhibiting Dahlias:

a) Measure your blooms with a ruler to see if you are putting them in the right section according to size.

b) Make certain that you have placed your exhibit in the right class section.

c) Do not crowd the blooms in one milk bottle where the flowers are going to touch one another, causing the petals to be bruised.

d) Do not cut the stem of the bloom so short that when it is placed in the milk bottle the petals will be damaged on the under side by the bottle. If the stem is short, put some paper or other material on the inside bottom of the bottle so that the flower will be raised.

e) Remember that the condition of the blooms when judged in the morning changes as time goes by. The condition of the flower may have deteriorated since it was judged.

f) Be sure to write the name of the Dahlia you are exhibiting on the tag. This is your opportunity to share beauty with others.

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Rosybloom Crabapples

J. R. ALMEY

This group of small ornamental trees gives to home owners, especially in towns and cities, an opportunity to plant a worth-while tree. The following observations are based on the writer's personal experience over the past fifteen years. There are many varieties of Rosybloom Crabs, and those who intend to grow them should make their selection carefully, because some varieties, which is to be expected, have not been found suitable for growing in this area. This, though, in part, may be due to the root stocks on which they were grown.

In 1939, I obtained the varieties **Okanakan** and **Cowichan**. These two never bloomed for me, but died back and cankered badly after reaching a height of five feet, and have since been removed.

In 1946, I planted **Athabasca**, **Sissipuk**, **Wabiscaw** and **Timiskaming** — the first three in cultivated soil and **Timiskaming** in the lawn. **Athabasca** started to bloom first and has in alternate years for the past six years made the best showing. The tree is a shapely grower, now 17 feet high; it shows no sunscald; the bloom is a light rose-pink; the fruit is edible and large enough to can, and makes fair jelly. The fruit ripens and drops early.

Sissipuk has bloomed for an equal number of years, but has only reached a height of 11 feet. The fruit on **Athabasca** has set and reached the size of peas by the time **Sissipuk** blooms. The bloom is on very short stems, small in size, a deeper rose-pink than **Athabasca**; fruit is small, about the size of marbles, bright red, and does not fall, remaining on the tree all winter. The fruit is bitter, deep red in colour. The tree, in general, seems to lack vigour, though, due to its late blooming habit and its small size, may find a place in the landscape.

Wabiscaw is a very strong, upright, columnar growing tree. It is now 18 feet high. The foliage is large and very heavy; it has only bloomed sparsely so far. Blooms are a full rose-pink. The fruit is large, a dull greenish red, not edible. This tree has crowded its location, and I had decided to discard this variety until late this fall, when its leaves turned a brilliant leathery crimson, and made the finest foliage colouring of all the Ottawa varieties. Now I am undecided as to what to do.

Timiskaming was planted at the same time as the above three varieties, but in the lawn. It has made a good, shapely tree, 15 feet high, but has not bloomed as yet.

Dauphin, planted in 1949, bloomed in 1952. This variety is noted for its early flowering. The colour of the flowers is pale pink; the fruit is medium size and edible.

All of the varieties mentioned so far were developed at the Central Experimental Farm, Ottawa.

In addition to the above, I have grown near Lake Winnipeg seedlings from the Experimental Station at Morden. These were planted in 1944. Out of these, number **1-Q-19-45** is worthy of growing. Its habit of growth is similar to Wabiscaw, upright, columnar. The flowers are a dull rose-pink; the fruit is small, bright red.

Two varieties are outstanding for their dark foliage, namely Strathmore and Sutherland. **Strathmore**, planted in 1944, is now 11 feet high, but has not bloomed as yet. Its twig and branch growth is thin and wiry, somewhat upright. Its foliage remains reddish green throughout the summer, and, when the season suits it, as it did in 1954, the leaves, before falling, turn a brilliant leathery crimson. **Sutherland**, in the early summer, has very dark reddish foliage. This I have only grown for three years. Its growth is somewhat slow and has yet to prove itself better than Strathmore for its dark foliage colouring.

One of the most recent additions to this group of brilliantly coloured flowering trees is the Morden Experimental Station introduction — **Almey**. This, planted some nine years ago, is now 14 feet high, has not shown any winter injury at Winnipeg, and has bloomed lightly for the past two years. The flowers are large, a brilliant carmine pink, with base of petals white. It holds its colour well under adverse weather. The fruit is small, scarle, and makes a rich red jelly. The fruit is persistant on the tree throughout the winter.

To sum up the varieties — if one intends to plant one tree only, plant the Almey; if two trees are required — Almey and Strathmore. If space allows the planting of three trees and uniformity of these three trees is not essential, in addition to the above mentioned two, plant Athabasca.

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The Soil as a Medium for Plant Growth

R. A. HEDLIN

Associate Professor of Soils, University of Manitoba.

PLANT REQUIREMENTS

Plants require a number of factors for their normal growth and development. There are air, light, water, suitable temperature, nutrients, mechanical support, proper reaction and an absence of toxic conditions. If these requirements are met, plants can be grown in artificial media such as nutrient solutions or sand cultures. In nature plants usually grow in the soil, and therefore we think of the soil as the natural medium for plant growth.

THE SOIL

Soil is composed of mineral matter and organic matter. About 90 to 95% of the weight of a dry soil is mineral matter and the remaining 5 to 10% is organic matter. The mineral matter comes from broken down rock material. These mineral particles in the soil are grouped on the basis of their size. The coarse particles which can be readily seen are known as sand, the finer particles which are floury in nature are known as silt and the very fine particles which tend to make soils sticky are known as clay. Soils which are high in sand are known as sandy soils, those high in silt as silty soils and those which are high in clay as clayey soils. If all these three sizes of particles are present in more or less equal proportions, the soil is a loam or a clay loam.

The soil organic matter comes from dead plant and animal material. This material has usually been at least partly decomposed by soil organisms and converted to a dark coloured material known as humus.

The sand, silt, clay and organic matter in soils do not usually make up more than about 50 per cent of the total volume. The remaining volume is taken up by spaces between the soil particles. These spaces are filled with air and water. In a moist friable loam soil, the total volume is divided approximately as follows: 50 per cent soil particles; 30 per cent water; and 20 per cent air.

Many soils differ greatly from this ideal condition. Sandy soils because they are porous in nature are usually well-drained and well-aerated but dry out quickly. Water does not drain freely from heavy clay soils and therefore they are inclined to become water-logged and hence poorly aerated.

The fertility of soils is greatly increased by organic matter. Organic matter acts as a sponge increasing the ability of sandy soils to retain water. On the other hand, it increases the porosity of clay soils so that they are more friable and easily worked. In addition to these effects, organic matter serves as a reserve of plant nutrients. As the organic matter is decomposed by soil organisms, plant nutrients are released in forms which plants can use. These nutrients are stored in the soil water (soil solution), or on the surface of soil particles. Thus it can be seen that a fertile soil is ideally suited to meet the growth requirements of plants. Under suitable climatic conditions, temperature, light, air and moisture are adequately supplied and the soil has a store of nutrients which are continually replenished if the crop residues are returned.

PLANT NUTRIENTS

Plants require fifteen elements for their normal growth and development. Three of these — carbon, hydrogen and oxygen — are obtained from air and water. They usually comprise about 90 per cent of the dry weight of plant material. The remaining twelve — nitrogen, phosphorus, potassium, calcium, magnesium, sulphur, iron, manganese, copper, zinc, boron and molybdenum — are obtained from the soil. They comprise about 5 to 7 per cent of the dry weight of plant material. In addition, plants contain other elements which are not essential for their growth.

Fertile soils usually supply plant nutrients in more or less adequate amounts. However, with continued cropping it is common for soils to become deficient in one or more nutrients. In plants, as in humans and animals, nutritional deficiencies usually result in some decrease in growth and, if very severe, in characteristic deficiency symptoms. In Western Canadian horticultural crops, deficiencies of phosphate, nitrogen and iron are the most common.

Phosphate is important in root and flower development. Where phosphate is deficient, maturity tends to be delayed, growth reduced and in severe cases the plant may develop a purplish tinge, on the stems and leaves.

Nitrogen deficiency occurs most frequently in cold, wet soils or in soils with a low organic matter content. Lack of nitrogen results in slow growth and a yellowing of the leaves. The lower leaves are usually affected first but in time the lack of colour is evident over the whole plant. An excess of nitrogen may result from frequent applications of manure or mineral fertilizers. This leads to a lush green vegetative growth and a delay in flowering and seed set.

Most grassland soils are relatively high in lime. This results in a deficiency in the supply of available iron, partic-

ularly for plants such as Mountain Ash, roses, raspberries and strawberries. Where iron deficiency occurs, the first evidence is usually a yellowing of the newer leaves. The veins remain green while the interveinal tissue turns yellow. In time, all the leaves may be affected and the upper leaves may turn almost white and then begin to die at the margins.

FERTILIZING GARDENS

1. Manure — barnyard manure is an excellent fertilizer for gardens. It should be applied at a rate of about half a ton per 1,000 square feet. If the garden is to be dug in the fall, it is preferable to apply manure and dig it into the soil at this time.

*2. Mineral Fertilizers — for most horticultural crops, a broadcast application of 11-48-0, 16-20-0, or 10-32-10 at about 10 pounds per 1,000 square feet is very satisfactory on most soils. Products such as 4-10-8 or 5-10-5 are equally satisfactory and will supply about the same amount of plant food if used at 20 to 25 pounds per 1,000 square feet. The fertilizer can be applied broadcast in the spring prior to planting and worked into the surface layer of soil.

Fertilizer can also be applied close to the seed at planting time. Where this is done fertilizer should be applied in bands beside the row, one or two inches from the seed or one or two inches below the seed. Rate of application should range from 5 to 12 ounces per 50 feet or row depending upon whether a high or low analysis fertilizer is used.

FERTILIZING LAWNS

On most soils in the Prairie Provinces lawns respond well to applications of nitrogen and to a lesser extent to phosphate applications. The following fertilizer treatments will supply these requirements.

1. An early spring application of 11-48-0 or 16-20-0 at about 10 lbs. per 1,000 square feet, or 5-10-5 or 4-10-8 at about 20 lbs. per 1,000 square feet.

2. Applications of ammonium sulphate (21-0-0) or ammonium nitrate (33½-0-0) at 8 to 10 lbs. per thousand square feet about every six weeks during the summer.

Fertilizers may burn the blades of grass. Danger of this can be minimized by fertilizing when the grass is dry and raking the grass after fertilizing to remove fertilizer dust that may cling to the grass.

* The figures refer to the percentage of nitrogen, phosphate and potash, e.g., 11-48-0 means that the fertilizer contains 11 per cent nitrogen, 48 per cent phosphate and 0 per cent potash. Products named are available under such trade names as Vigoro, Elephant Brand and Gardenite.

TREATMENT OF IRON DEFICIENCY

Iron deficiency is commonly treated in the following ways:

1. Spraying with a solution of ferrous sulphate. The solution is prepared by mixing about one ounce of ferrous sulphate in a gallon of water. Ferrous sulphate can be more readily dissolved if about one ounce of citric acid is added to the solution.

A small amount of detergent added to the solution will make it spread more readily when applied to the leaves. This solution should be sprayed on the plant when the deficiency symptoms begin to appear or in the case of perennials, if experience indicates that the deficiency is likely to occur, the plants should be sprayed early in the season. Spraying may need to be repeated two or three times during the summer months. Excess spray should be avoided as it may cause burning of the leaves.

2. Applying ferrous sulphate to the soil — shrubs and trees can frequently be effectively treated for lime induced chlorosis by applying ferrous sulphate in nests or pockets near the feeding roots of the tree or shrub. This can be done by making a number of holes with a pointed bar or small auger around the tree or shrub at about 1 to 3 feet from the base and one to two feet in depth. Into each hole place a small amount of ferrous sulphate — one to two pounds per tree or shrub — depending on the size. Water well.

SOIL REACTION

Soil reaction refers to the state of the soil being acid or alkaline. In humid climates soils tend to become acid. Under these conditions, ground limestone must be added to the soil periodically to neutralize the acidity. In regions of low rainfall, soils tend to remain neutral or alkaline in reaction since there is little or no leaching of lime from the soil. Frequently, lime will accumulate at the soil surface or at least close enough to the surface so that any disturbance such as excavating may bring a soil material very high in lime to the surface. This excess of lime is undesirable since it makes elements such as iron and phosphate unavailable to plants.

Associated with low rainfall is another problem which may be of concern to gardeners. If rainfall is low and drainage poor, soluble salts may accumulate at the surface. This condition is frequently known as "alkali" or "white alkali". However, it is more correctly termed salinity since the problem is not due to a strongly alkaline reaction but rather an accumulation of salts which has completely inhibited or stopped plant growth. Many horticultural crops such as trees, fruit trees, shrubs and flowers are very susceptible to salinity.

Where possible, saline areas should be avoided. If there is question as to the presence of salts, an analysis of the soil should be obtained. *

SOIL STRUCTURE

Soil structure refers to arrangement of soil particles. Because of soil particle arrangement, some soils tend to break up into a fine granular condition so that they are friable and easily worked. Other soils tend to form hard, dense clods which are difficult to work and unfavorable for plant root development, particularly of root crops.

There is no simple way of influencing soil structure. Recent experiments with synthetic soil conditioners, Krilium, Loxar, Aerotil, etc., indicate that while they visibly improve the structure of intractable soils, the effect on plant growth is usually slight. In addition, even if spectacular results were obtained, the cost would be prohibitive for all but very small areas. Therefore, we must rely on proper tillage — working the soil only when at the proper moisture content — and frequent applications of manure or composts to keep heavy soils in a workable condition.

* Most Provincial Universities analyze soils without charge.

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Typical Tubers of Manota Variety Showing Side, Seed End and Stem End Views

Potato Varieties for Manitoba

PROF. J. A. MENZIES

University of Manitoba

There are a large number of potato varieties grown in Manitoba. However, only a few of the more important varieties will be listed here.

EARLY MATURITY

Warba—White, rough, blocky tubers with very deep eyes. Cooking quality and yielding ability are good. The tubers size up early and digging can start in July. A good idea is to dig a few hills every few days to supply family needs. If left until fall the tubers become very large and rough.

Red Warba—Same as Warba but it has a red skin.

Early Ohio—Pink, attractive tubers. Eyes are slightly raised. Yielding ability is poor, cooking quality good. On heavy soils such as the Red River Valley it tends to be rough, knobby and unattractive.

MIDSEASON MATURITY

Irish Cobbler—White tuber with medium deep eyes. Good yielding ability and good cooking qualities. On heavy soils, tubers tend to be rough and have a lot of hollow heart.

Manota — White, very smooth, shallow eyed, attractive tubers. Yielding ability and cooking quality are good. It is well adapted to Manitoba conditions and on the heavy soils of the Red River Valley it retains its shape and attractiveness.

LATE MATURITY

Pontiac—Red skin, attractive tubers, medium deep eyes. Very good yielding ability but only fair quality. It is well adapted to Manitoba conditions and widely grown.

Netted Gem—Russet skin, attractive, shallow-eyed tubers. Yielding ability is poor but cooking quality is good. It requires a light soil with uniform moisture, otherwise it produces many rough, knobby tubers.

Columbia Russet—Coarse russet skin, eyes shallow, tubers attractive. Yielding ability is fair, cooking quality good.

Kennebec—A very late, white tuber with shallow eyes. Yielding ability is good, cooking quality fair to good. On heavy soils it tends to be rough and oversize. This tendency can be overcome by closer spacing. This variety is resistant to late blight.

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H. R. HIKIDA

Agricultural Research Officer, University of Manitoba.

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The one way to achieve the real fresh, natural herb flavour and fragrance is to grow your own backyard herb garden. A beginner can raise them easily and it takes only a small patch of ground to raise all the herbs needed for summer with plenty left over to dry for winter use.

The herb plot may be a small formal garden, an informal border, or just a few rows at the edge of the vegetable garden. It should be within easy reach of the kitchen door so that the plants can be readily cared for and easily gathered. A very small plot will hold quite a number of kinds of herbs because only a few plants of each are needed.

In the vegetable garden, plant the herbs in rows, taking care that the tall plants do not shade the small ones. For an ornamental border planting, place tall herbs such as dill, coriander, sweet fennel, and rosemary in the background; group the medium tall here and there in front of the tall — namely anise, balm, caraway, borage, lavender, sweet marjoram, sage; edge the border with dwarfier plants such as basil, thyme, parsley, or chive. The same idea may be carried out in a charming bit of formal landscaping beside the kitchen door.

Well-drained soil of a loamy nature is excellent for most herbs, and they can usually endure more dryness than most of the other plants in the garden. They like a sunny location.

Parsley, chervil, and chives prefer some shade and a somewhat richer, heavier soil.

The method of drying is much the same for all the various herbs. Leaves and tender stems of balm, basil, borage, rosemary, sage, savory, fennel, marjoram, and thyme are cut in the young stage and dried slowly in a dustless, airy, darkened room. They may be tied in small bunches and hung head downward; or, they may be placed in roomy paper bags, loosely tied, and hung up. Each kind of herb should be labelled as they look much alike when dried.

Cut flowering branches of lavender on a sunny day when the whole spike has bloomed and the lowest blossoms have begun to darken. Place them in small cloth bags for scenting linens and clothes closets.

Seed heads of anise, dill, caraway, coriander, and fennel are harvested with short stems as soon as they begin to ripen, are dried on thin cheese cloth or muslin in the shade, and stored in a dry airy place in covered containers. The seeds should be washed before being used in cooking.

ANISE grows readily from seed sown outdoors in spring. It needs a warm, sunny location. Thin the young plants to stand 8 to 12 inches apart. This herb has lacy leaves and heads of white flowers which mature into seeds — the part used for cooking.

BALM sometimes called "Lemon Balm", has a lemony, mint-like scent and a sharp, refreshing lemon peel taste. The rough leaves are deep green in colour. Balm grows readily from seed sown outdoors in spring.

BASIL or SWEET BASIL is a bushy, tropical annual, easily grown from seed planted directly outdoors. The light yellow-green leaves and tender tips are spicy and flower-like in flavour and odour. The plants may be potted for winter use.

BORAGE is a rough-stemmed annual with clusters of lovely blue flowers and a faint flavour of cucumber. Sow the seed outdoors in spring in a sunny exposure. Since the herb matures rapidly, several plants could be made at intervals for fresh young leaves and blossoms for all summer. The blossoms give a touch of colour when used with the leaves.

CARAWAY will produce seeds the first year only in sections of the country where it can be planted very early; in colder sections, the seeds mature early the second summer. They grow in heads or umbels.

CHERVIL resembles a fine leaved parsley and tastes something like parsley and fennel combined. Sow the seed in early spring in rich well-prepared garden soil. It will sometimes be two or three weeks before the plants will appear, but they will then make rapid growth.

CHIVES, a small member of the onion family, has small grass-like leaves and pretty purple flower-heads. The young tender leaves have delicate, pleasing flavour like that of a very mild onion, they may be cut freely for they continue to send up new shoots. Chives grow readily from seed in rich garden soil. The plants are perennial and live from year to year. One or two clumps may be potted in fall for winter use.

CORIANDER has flowers tinted with pale rose, and foliage of soft green. Plant seed outdoors in spring, and thin the plants to about 18 inches apart. The seeds which grow in

clusters are somewhat unpleasant smelling when green, but when ripe they are delicious like orange in odour and taste.

DILL grows rapidly, and by sowing seed early the matured seeds which grow in umbels like caraway will be ready for use the first year. The plants grow tall and should be thinned to from 12 to 15 inches apart when young. Both foliage and seeds are used for flavouring.

HOREHOUND, hardy, branched, spreading perennial of strong aromatic odour; 1 to 3 feet tall; leaves for seasoning and extract used in medical preparations.

HYSSOP, half hardy, shrubby perennial; about 1½ feet tall; of a strong fragrant odour and pungent flavour; extract used as stimulant, tonic and in perfumery.

LAVENDER is one of the few herbs that for best results should be started indoors and later transplanted. Lavender is grown entirely for its fragrance, fresh and dried.

PARSLEY with its rich dark green leaves needs little description, it is so well known. Some of the new moss curled varieties are unusually attractive. The seed germinates slowly. Sow in spring outdoors in partial shade, if possible, and in rich garden soil. Or, sow the seed indoors and transplant later. If the leaves are cut off when the plants are about three inches tall, the new growth will be brighter and better curled.

ROSEMARY has a sweet scent suggestive of "nutmeg and pine needles" to some people. The flavour is warm and pungent. The leaves are green above and light gray-green beneath; the loose flower clusters are pale blue. Plant the seed outdoors in spring.

RUE, hardy, somewhat bushy perennial 1½ to 2 feet tall; of a peculiar unpleasant odour and bitter acrid flavour; used chiefly in medicine.

SAFFRON, annual about 2 feet tall; of tree-like habit; the numerous thistle-like flower heads used chiefly in manufacturing of cosmetics; leaves used for flavouring.

SAGE of the well-known garden variety is a shrubby gray-leaved plant with blue flowers. The plants when thinned should stand at least 12 inches apart. The young stems with their tender leaves may be cut twice during the growing season.

SUMMER SAVORY is an erect bush plant of small size. It grows readily from seed planted outdoors in spring. The young, tender leaves are the parts used. They may be cut off for drying about midsummer.

SWEET FENNEL has stems that are like celery. The feathery leaves are attractive. Seeds, leaves, and tender stems are all used for their very distinctive flavour. Sow the seed outdoors in spring and thin the plants to 18 inches apart.

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SWEET MARJORAM is a bushy little plant with soft foliage and purple flowers in hop-like heads. Sow the seeds in early spring. The leaves are used fresh and dried, and the plants may be potted for winter use. This was one of the popular herbs of colonial days.

THYME is a small bushy plant which may be started from seed in spring. The leaves and young shoots are sharply aromatic.

WORMWOOD, hardy perennial forming large rosette in first year and branched flowering stem 3 to 5 feet tall in the second year; of fragrant spicy odour and intensely bitter flavour; used as tonic, vermifuge and sometimes for seasoning.

Use herbs in small quantities; let them furnish a delicate flavour instead of dominating the taste of food.

GREEN SALAD: Use a thinly cut, crisp lettuce foundation. Scatter over it a few chopped fresh leaves of anise, caraway, parsley, and chives. Toss together with French Dressing. A different approach; use a mixture of parsley, chervil, chives, and thyme or savory.

BREAD STUFFING FOR FOWL is improved by mixing in thoroughly $\frac{1}{4}$ tsp. thyme, $\frac{1}{2}$ tsp. powdered sage, $\frac{1}{2}$ tsp. chopped chives, and $\frac{1}{4}$ tsp. summer savory. Use them singly or in combination.

FOR ICED DRINKS wrap such herbs as thyme, borage, marjoram, in a cloth and bruise; then steep in the hot tea or other liquid and cool before using.

SPRINKLE CHOPPED FRESH LEAVES of dill on broiled steaks or chops, cover with hot melted butter, and allow to stand in a hot oven a few minutes before serving.

FOR FLAVOURING OMELETTES try these combinations:

- (1) Thyme, basil, summer savory, chives
- (2) Basil, thyme, sweet marjoram, parsley
- (3) Chives, parsley, summer savory, basil.

ADD CHOPPED BASIL to tomato sandwiches, to bean soup, to sauces for spaghetti. Use about two small leaves to each serving.

PICKLED BEETS receive a distinctive new flavour from the addition of a few dill or fennel seeds in the hot vinegar-and-sugar, or sprinkled over the beets before the liquid is added.

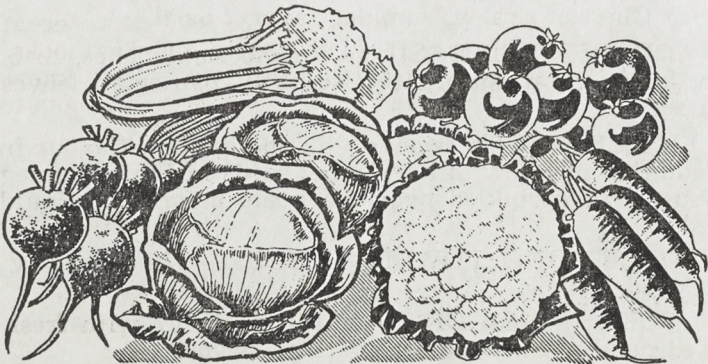
TOP BAKING POWDER BISCUIT with caraway or anise seed.

COOK A PINCH OF SUMMER SAVORY with fresh or canned peas or beans to accent their flavour.

Make Your Vegetable Garden A "Busy Producer"

With careful planning your garden can be busy and productive from spring through autumn. Here are a few suggestions that may help you:

1. Arrange your plantings to get a continuous supply throughout the season, rather than a large amount at one time.
2. Take advantage of "early" and "late" varieties.
3. Make sowings of short-season sorts every few weeks for what is termed "succession" cropping.
4. Crowd quick companion crops, like lettuce, between slow kinds like cabbage. The quick ones will mature before the others need room.
5. Make a good seed bed. Usually a steel toothed rake does the work best, though many gardeners find the additional use of a hoe, prior to raking, helpful. The important thing is to get a good lump-free seed bed.
6. Feed your garden with complete plant food (Vigoro). It's the way to get a rich harvest of tender, nutritious vegetables because complete plant food provides all the nutrients vegetables need from soil for best growth.
7. Keep your garden free of weeds. The main thing about weeds is to get them when they are small and always keep ahead of them. A sharp hoe is the preference of most small-plot gardeners.
8. Don't plant too much seed—the fault of most beginners. It means much additional labor in thinning and proper spacing. And, even more important, the early crowded condition of growth and pulling plants that may have entwined roots, means a disturbance that plants are often slow to overcome.



Gerard's Herbal

M. V. CHESNUT, F.R.H.S., Winnipeg, Man.

I guess I must be a natural-born sucker for garden books, for I buy practically every one to come off the press, and my garden library is becoming uncomfortably crowded. If I had to choose but one single book, though, I'd sacrifice the whole works before I'd part with my copy of Gerard's "Herbal".

John Gerard was born at Nantwich, England, in 1545, and attracted to the study of medicine, he took his examinations and became a "Master in Chirurgie" in the City of London. He was always a keen gardener, and when his medical practice prospered, he took a very large garden near Somerset House where he tried out everything from meadow weeds to exotic tropical plants such as ginger and sugar cane, most of which perished miserably in the dark London fogs.

Every gardener worthy of the name is a keen observer—he HAS to be, if he is to learn the habits, and the likes and dislikes of his plants. Gerard had eyes like a hawk for all the little details so often missed when studying a plant, and everything he saw, he wrote down, crystal clear, in his beautiful Elizabethan English. Have a look, for instance, at his description of our common pest, Couch grass:

"Couch-grasse hath long leaves of a whitish greene colour; the stalke is a cubit and a halfe high, with joynts like wheaten strawes, but these joynts are covered with a little short downe or woollinesse. It creepeth in the ground hither and thither with long white roots, joynted at certaine distances, having a pleasant sweet tast. Insomuch as where it hapneth in gardens among the pot-herbes, grate labour must be taken before it can be destroyed, each piece being apt to grow, and every way to dilate it selfe, as an infirmitie or plague. These Grasses seldome come to shew their eare before July. His physicke vertue: Couch-grasse healeth green wounds."

You see what I mean about his powers of observation. Reams have been written about Couch grass in text-books and government bulletins on weed control, but I never knew before that the plant had hairy knees, nor that the roots has a sweet taste.

Even as you and I, Gerard had his troubles with casual garden helpers. In telling the story of the Syrian Convulvulus, he says: "It doth grow in the Isle of Candia, from whence I had some seeds, of which seed I received two plants which prospered exceedingly; the one whereof I bestowed upon a learned Apothecary of Colchester, which continueth to this day. But an ignorant weeder of my garden plucked mine up, and cast it away in my absence, in stead of a weed."

Here are a few of John Gerard's delightful and most human observations:

OF WHEAT: "Those Wheats do nourish the most that be hard, and have their whole substance so closely compact as they can scarcely be bit asunder; for such do nourish very much: and the contrary but little."

OF OATS: "Otemeale be good for to make a faire and wel coloured maid to looke like a cake of tallow, especially if she take next her stomacke a good draught of strong vinegre after it."

OF TULIPS: "I do verily thinke that these are the Lillies of the field mentioned by our Saviour, for their floures resemble Lillies; and in the places whereas our Saviour was conversant they grow wilde in the fields."

OF ONIONS: "The Onion requireth a fat ground wel digged and dunded. Being eaten, yea though it be boiled, it causeth headacke, hurteth the eies, and maketh a man dim sighted. The juice anointed upon a bald head in the Sun bringeth the haire againe very speedily."

OF TURNIPS: "The Turnep prospereth wel in a light loose and fat earth, so loose that it may be turned almost into dust. The Small Turnep growes by Hachney in a sandy ground, and are the best I ever tasted."

OF TARRAGON: "The Antients say that a seed of Flax put into a Raddish root and so set, doth bring forth this herbe Tarragon, but I think this is not so."

OF LETTUCE: "Lettuce delighteth to grow in a manured, fat, moist ground, and prospereth best if it be sown very thin. Eaten before meat, it stirreth up appetite: eaten after supper, it keepeth away drunkenesse which commeth by the wine, by reason that it staieth the vapours from rising to the head."

OF THE FOUR O'CLOCK: "I have by practise found a way to keepe the roots for the yere following, which never faileth: At the first frost, I dig up the roots and put them in a butter ferkin, and filled with the sands of a river, the which I suffer still to stand untill Aprill, if the weather be warme, at which time I take it from the sand and plant it in the garden, where it doth flourish exceedingly. which doth not those sown of seede the same yere."

OF LILY-OF-THE-VALLEY: "The floures of the Valley Lillie distilled with wine, and drunke the quantitie of a spoonfull, restore speech unto those that have the dumb palsie and that are falne into the Apoplexie."

OF DAISIES: "The juice of the leaves given to little dogs with milke keepeth them from growing great."

OF ANCHUSA: "The Alkanets doe yeeld their bloody juyce in harvest time. It be good to drive forth the meesels

and small pox if it be drunke with hot beere. The Gentlewomen of France doe paint their faces with these roots, as it is said."

OF SOLOMON'S SEAL: "The roots, stamped while it is fresh and applied, takketh away in one night any bruise, blacke or blew spots gotten by fals or womens wilfulness, in stumbling upon their hasty husbands fists, or such like."

With his beautifully clear style of writing, there is only one part of the Herbal where Gerard has shown any ambiguity. It is in the chapter on rhubarb, and reads as follows: "Brake the stems into a stone pot with foure gallons of strong ale, to steepe or infuse the space of three daies, and then drinke. It purifieth the bloud, and makes yong wenches look faire and cherry-like."

The thing that puzzles me is — who drinks the four gallons of ale and rhubarb — the "yong wenches" or the fellow who looks them over?

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Recommended Perennials for Manitoba

List Prepared by a Committee of the Manitoba
Horticultural Association

The name commonly used by nurserymen is given in this list, arranged alphabetically.

Most perennials like sunshine, and well-drained good garden soil. Plants that need special locations are noted.

Season of bloom, height and colour is given. The plants listed should prove hardy in the agricultural areas of Manitoba; local soil or other conditions may influence the behaviour of some varieties.

ACHILLEA

White (The Pearl) - 2 ft. - June.

Mauve (Cerise Queen) - 2 ft. - July.

Red - Forms are good.

ACONITUM (Monkshood)

Blue - 4 ft. - July.

Blue and White (Bicolor)

(Both forms are poisonous).

ALYSSUM SAXATILE (Gold-Dust)

Yellow - 1 ft. - May.

ANCHUSA ITALICA (Bugloss)

Blue - 3 ft. - July.

AQUILEGIA - COLUMBINE

Mixed Colours - 2½ ft. - June.

(Long spurred hybrids most popular).

ASTER (Michaelmas Daisy)

Various shades, **blue, red, white** - 4 ft. - Late summer.

Recommended Varieties —

LIL FARDELL - **Pink** - 5 ft.

BEACHWOOD CHALLENGER - **Red** - 2 ft.

MOUNT EVEREST - **White** - 4 ft.

LITTLE BOY BLUE - **Blue** - 2½ ft.

SNOWSPRITE - **White** - 1 ft.

MARJORIE - **Pink** - 1 ft.

AUBRETIA

Mixed colours - 6 ins. - May.
(Rock garden).

BETONICA GRANDIFLORA (Bee-

balm) **Pink** - 1 ft. - July.

ALLUM (Flowering Onion)

Rock garden - 1 ft.

BLEEDING HEART (Dicentra)

Pink - 2½ ft. - May - June.

BOCCONIA (Plume Poppy)

10 ft. - July - August.

(Background - Ornamental Plant).

BALLOON FLOWER (Platycodon)

Blue or White - 2½ ft. - July - August.

CAMPANULA (Bellflower)

Several hardy species.

Recommended are:

CARPATICA (Carpathian Bellflower) - **Blue or White** - 10 ins. - June.

CAESPITOSA - **Blue or White** - 4 ins. - July - August. (Rock garden)

GLOMERATA (Clustered Bellflower) - **Purple** - 3 ft., and a dwarf form 6 ins. - July.

CENTAUREA MONTANA (Cornflower)

- **Blue, White, Purple** - 1½ ft. - July - August.

CERASTIUM (Snow in Summer)

White - 6 ins. - June.

CHINESE LARKSPUR

(Delphinium Chinensis)

White, Mauve, Blue - 2 ft. - July - August.

CHRYSANTHEMUM

(Border Varieties)

The following are recommended:

GOLDLOCKS - **Yellow** - 2 ft.

HARBINGER - **Bronze** - 2 ft.

HARMONY - **Bronze** - 2 ft.

DAISY MAE - **Pink** - 2 ft.

DROPMORE ROSE - **Rose Pink** - 15 ins.

PYGMY PINK - **Pink** - 9 ins.

CLEMATIS INTEGRIFOLIA

Blue - 3 ft. - June to August.

CLEMATIS RECTA

Creamy White - 4 ft. - June - July.
Selected strains most satisfactory.

DAY LILY (*Hemerocallis*)

The following varieties are recommended:

FLAVA - **Yellow** - 3-4 ft.
THUNBERGII - **Orange** - 4 ft.
AURANTIACA - **Orange** - 3-4 ft.
MIKADO - **Orange** - 3½ ft.
WONDER GOLD - **Yellow** - 3½ ft.
CITRINA - **Lemon** - 3 ft.

DIANTHUS (*Pinks*)

White, Pink or Red - 6-12 ins. - June. (Rock garden)

DICTAMNUS (*Gas Plant*)

White or Pink - 2½ ft. - June.

ERIGERON SPECIOSUM (*Fleabane*)

Lavender - **Blue** - 2 ft. - June - July.

FRITALLARIA PALLIDIFLORA

(*Fritillary*) - **Yellow** - 1 ft. - May.

GAILLARDIA

Red, Brown, Yellow - 2½ ft. - June to September.

GLOBE THISTLE (*Echinops*)

Ornamental flower heads and foliage - 4 ft. - summer.

GYPSOPHILIA (*Baby's Breath*)

Useful as filler - 2½ ft. - July.
Single and double forms.

HELIANTHUS

Yellow - 6 ft.

HELIOPSIS

Yellow - 4 ft. - August.

HEUCHERA (*Coral Bells*)

Pink - 12 to 18 ins. - June - July.

HOSTA (*Funkia*)

Decorative foliage - Shade Loving - 2 ft.

IRIS BEARDED

The following varieties are recommended:

CITY OF LINCOLN - **Yellow** and **red**.
SABLE - **Deep Violet**.
PRAIRIE SUNSET - **Coppery**.
ELMOHR - **Purple**.
SHARKSKIN - **White**.
MELANIE - **Pink**.

IRIS (*Siberian Iris*)

Blue or White - 3 ft. - June.

IRIS ARENARIA (*Grass Iris*)

Yellow - 18 ins. - June.

LAVATERA (*Mallow*)

Pink - 3½ ft. - July - August.

LILY OF THE VALLEY

White - 6 ins. - May - June. Shade loving.

LIATRIS (*Blazing Star*)

Purple - 18 ins. - July.

LUPINS

Various colours - 2½ ft. - July - August. (Need acid soil)

LILIES

CONCOLOR - **Red** - 2 ft. - June.

DAURICUM (*Candlestick*)

Orange - 2½ ft. - July.

HENRY I - **Yellow** - 3 ft. - Aug.

MAXWILL - **Orange** - 5 ft. - July.

TIGRINUM (*Tiger Lily*)

Orange - 4 ft. - August.

TENUIFOLIUM (*Coral Lily*)

Red - 1½ ft. - June.

MARTIGON HYBRIDS

Various colours - 4 ft. - July.

Shade loving)

STENOGRAPHER HYBRIDS

Orange shades - 4 ft. - July - Aug.

LIGULARIA SPECIOSA (*Ray Flower*)

Yellow - 6 ft. - July - August.

LYCHNIS CHALCEDONICA

Scarlet - 3 ft. - July.

LYCHNIS CORONARIA

Crimson - 1 ft. - July.

LYCHNIS VISCARIA

Deep Pink - 1 ft. - June.

LYSIMACHIA MUMMULARIA

(*Moneywort*)

Yellow - 6 ins. - June-July. Rock garden.

LYTHRUM - **MORDEN PINK**

(*Loosestrife*)

Pink - 4 ft. - July - August.

MERTENSIA

Blue - 2 ft. - May.

NEPETA (*Catnip*)

DROPMORE HYBRID - **Blue** - 1½ ft. - August - September.

SOUV. D'ANDRE CHAUDRON

Blue - July - August.

PEONY

The following are recommended:

FESTIVA MAXIMA - **White**.

BARONESS SCHROEDER - **White**.

MONS. JULES ELIE - **Pink**.

SARAH BERNHARDT - **Pink**.

FELIX CROUSSE - **Red**.

AUGUSTE DESSERT - **Red**.

PENTSTEMON

Red - 2 ft. - June.

POPPY**ORIENTAL** - Red - 2 ft. - June.**ICELAND** - Yellow, White, Red - 1 ft. - May.**PHLOX** (Tall)

2 ft. - August.

White Pyramid and Ada Black-jack (Mauve) recommended.

PHLOX SUBULATA (Moss Phlox)

White, Pink, Red - Rockery Plant.

POLEMONIUM (Jacob's-ladder)

Blue or White - 3 ft. - June.

PYRETHRUM (Painted Daisy)

White to Crimson - 18 ins. - May - June.

RANUNCULUS (Double Buttercup)

Yellow - 2 ft. - July.

RUDBECKIA (Golden glow)

Yellow - 5 ft. - August.

RIBBON GRASS

Ornamental Leaves - 3 ft.

SAPONARIA OCIMOIDES

Mauve - 12 ins. - June.

SAPONARIA OFFICINALIS

(Bouncing Bet) - Pink or White - 3 ft. - July.

SALVIA PRAETENSIS

(Meadow Sage) - Blue - 2 ft. - June.

SAXIFRAGA CRASSIFOLIA

Pink flowers - 12 ins. Foliage Plant.

SCABIOSA CAUCASICA

Blue, Mauve, White - 3 ft. - July - August.

SCILLA (Squills)

Blue or White - 6 ins. - May.

SEDUMS (Acre, Kamschaticum, Spec-tabile, Spurium)

Rock garden foliage plants.

SEMPERVIVUM (Hens and Chickens)

Rock garden foliage plants. Several Varieties.

SIDALCEA (Mallow)

White or Rose - 3 ft. - July.

POLYGONATUM (Solomon's Seal)

Shade Plant. 4 ft. - May - June.

SEA HOLLY (Eryngium)

Bluish leaves - 2 ft.

SHASTA DAISY

White - 2 ft. - Summer.

STATICE (Sea Lavender)

Mauve, filler and everlasting - 3 ft. - August.

SPIREA ARUNCUS (Goat's Beard)

White - 4 ft. - July.

SPIRAEA FILIPENDULA (Dropwort)

White, Pink, Red - July.

SPIRAEA ULMARIA (Meadowsweet)

White - 4 ft. - July.

SWEET ROCKET (Hesperis)

White, Blue, Pink, Mauve - 3 ft. - May - June.

THALICTRUM (Meadow Rue)

Foliage and flowers - 4 ft. - July.

TROLLIUS (Globe Flower)

Yellow - 2 ft. - June - July.

TULIP SPECIES

TARDA - Yellow - 4 ins. - April - May. Rock garden.

VALERIAN (Garden Heliotrope)

White - 4 ft. - July.

VERONICA (Speedwell)

Blue - 2 ft. - July.

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Annual Flowers

List Prepared by a Committee of the
Manitoba Horticultural Association

In this paper annual flowers are classified as to height: 36", 18", 10", 6" and less than 6".

The Key as to planting methods is as follows:

- * start inside home or under glass.
- ** seed in open ground.
- *** may be sown inside or outside.

Recommendations as to sun or shade:

- S - Sun.
- SH. - Shade.
- P.SH. - Partial Shade.

Key to colors:

PK - Pink, R - Red, Y - Yellow, P - Purple, B - Blue, O - Orange, etc.,

Seeds started indoors, in almost all cases, do best in temperatures 65 degrees to 75 degrees. Germinating time is from 1 to 6 weeks, but most will germinate in 2 to 3 weeks. The usual life of flower seed is generally 2 to 3 years.

Never water seedlings at night. If needed, water should be applied in the morning.

Common Name	Generic Name	Seeding	Location	Color
(1) 36" or over				
Spider Plant	Cleome	*	S.P.SH.	PK.W.
Cosmos	Cosmos	**	S	R.W.Y.
Gourds	Cucurbita	**	S	
Sunflower	Helianthus	**	S	R.W.
Sweet Pea	Lathyrus	**	S	B.R.W.PK.P.
Tobacco	Nicotiana	*	S.SH.	R.W.
African Marigold	Tagetes	**	S.SH.	R.Y.
(2) 18" or over				
Snapdragon	Antirrhinum	*	P.SH.	PK.R.Y.W.
Aster	Callistephus	*	S.P.SH.	B.R.W.PK.
Bachelor's-button	Centaurea	**	S.	B.P.PK.W.
Sweetsultan	Sweetsultan	**	S.	B.R.Y.W.
Annual Chrysanthemum	Chrysanthemum	**	S.P.SH.	P.R.Y.W.
Clarkia	Clarkia	**	S.	PK.R.Y.
Calliopsis	Coreopsis	**	**	Y.R.
Chinese Forget-Me-Not	Cynoglossum	***	S.H.	B.
Dwarf Annual Dahlia	Dahlia	*	S.	P.R.Y.W.
Larkspur	Delphinium	***	SH.	B.R.W.
Burning Bush	Kochia	***	S.	Foliage Plant
Mallow	Lavatera	***	S.	R.W.
Statice	Limonium	*	S.	B.R.Y.W.
Stocks	Mathiola	*	S.P.SH.	B.R.Y.W.
Love-In-A-Mist	Nigella	**	S.	B.W.
Poppy	Papaver	**	S.	PK.R.W.
Annual Phlox	Phlox	*	S.P.SH.	R.W.Y.P.PK.B.
Mignonette	Reseda	***	S.	R.Y.W.
Coneflower	Rudbeckia	*	S.	Y.
Salpiglossis	Salpiglossis	***	SH.	B.R.Y.W.

Common Name	Generic Name	Seeding	Location	Color
Scabiosa	Scabiosa	**	S.	B.R.W.
Zinnia	Zinnia	***	S.	R.Y.W.
Cockscomb	Celosia	*	S.	R.Y.O.
(3) 10" to 18"				
Med. Snapdragon	Antirrhinum	*	S.P.SH.	PK.R.Y.W.
Pot Marigold	Calendula	**	S.	R.Y.
Painted Daisy	Chrysanthemum	*	S.	Y.
Carnation	Dianthus	*	S.	R.W.PK.Y.
African Daisy	Dimorphotheca	***	S.	R.Y.W.
California Poppy	Eschscholtzia	**	S.	O.Y.W.
Gaillardia	Gaillardia	*	S.	R.Y.
Satan Flower	Godetia	**	S.	PK.R.W.
Straw Flower	Helichrysum	***	S.	R.Y.W.
Petunia	Petunia	*	S.P.SH.	B.R.W.PK.P.
Salvia	Salvia	**	S.	R.
Butterfly Flower	Schizanthus	***	S.	PK.R.W.
Nasturtium	Tropaeolum	***	S.P.SH.	R.Y.
Verbena	Verbena	*	S.P.SH.	B.R.W.PK.
Balsam	Balsam	*	S.P.SH.	R.PK.W.
Dwarf — Less 10"				
Snapdragon	Antirrhinum	*	S.	R.Y.W.PK.
Candytuft	Iberis	**	S.	P.R.W.
Viscaria	Lychnis	**	S.	B.R.W.
Cup Flower	Nierembergia	*	S.	B.
Annual Phlox	Phlox	*	S.P.SH.	B.R.Y.W.PK.
French Marigold	Tagetes	***	S.	R.Y.
Dusty Miller	Centaurea	*	S.SH.	White foliage
(4) Dwarf Borders 6" and less				
Ageratum	Ageratum	*	S.P.SH.	B.PK.W.
Lobelia	Lobelia	*	S.P.SH.	B.W.
Sweet Alyssum	Lobelia	***	S.	P.W.
Nemesia	Nemesia	*	S.P.SH.	B.R.Y.W.
Portulaca	Portulaca	***	S.	R.Y.W.PK.
Pansy	Viola	***	S.P.SH.	P.B.Y.R.W.
Viola	Viola	***	S.P.SH.	B.Y.W.R.

Other Flowers Treated as Annuals

GERANIUM (PELARGONIUM) Are suitable for bedding plants. They are generally started from cuttings, and grow best on well raised beds. Care should be taken that plants are not over watered, and that water is not put on the foliage. Here are some of the suitable varieties:

Red Wing, Radio Red, Ricard, Camille.

CANNA These can be grown from Rhizomes started very early in February. They require plenty of water and a sunny location for best results. When planted outdoors they do best when given some protection from heavy winds if possible. Recommended varieties are:

President—Large red flower, green foliage;

City of Portland—Large Pink flowers, green foliage.;

King Humbert—Scarlet Flower, Bronze foliage;

Yellow King Humbert—Yellow-Red specks, Green foliage.

BEGONIA Tuberous rooted. Bulbs are best started early in February in flats, using 50% peat in the soil mixture, then transplanted into pots. If started from seed the seed must be sown in January. The seed is very fine. Bulbs can be procured to give colors such as yellow, scarlet, pink, white, bronze, orange and rose.

OXALIS As a border plant, bulbs can be planted outside after 24th of May. Colors—red, pink.

ANEMONES (WINDFLOWER) The plants are sparse bloomers, but have excellent flower colors. They can be started indoors or planted directly outdoors. Various colors.

COLEUS Bright-leaved plant with many colors of foliage. Can be grown from cuttings, or from seeds started indoors. They are good window box fillers, but when used outdoors as foliage in beds, do best in North and East locations.

Vines or Climbers Treated as Annuals

MADERIA VINE (BASELLOIDES) Tuberous rooted, non-flowering, light green leaved, fast growing vine reaching from 10' to 20'. Started inside in pots or seeded directly outside.

MORNING GLORY (IPOMOEA) Blooms late, unless started inside and pot bound before transplanting. Reaching to 12 ft. Good varieties are: Heavenly Blue, Pearly Gates (White), Scarlet O'Hara.

COBAEA SCANDENS Rapid growing climber 15 to 30 feet, large bell-shaped mauve and ivory flower, will cling to any rough surface. Seed started early indoors.

SCARLET RUNNER BEANS Bright green foliage, scarlet flowers, edible beans if picked before beans harden. Seed outdoors.

SWEET PEAS Our most popular climber. Grows best on heavy, well fertilized soil, subject to attacks by red spider, mite, aphids. The new Zvolanek's (multi flora) class carries long stems and 5 to 6 flowers.

PASSION FLOWER (PASSIFLORA) Tender climber to 10 feet, very beautiful flowers, sparsely produced. The broad-leaved variety is best. Start inside from cuttings or seed, and grow in warm location.

CANARY BIRD VINE Dainty climber to 10 feet. Yellow bird-like flowers. Start inside.

GOURDS Rough foliage, but fruit very decorative for winter ornaments. Seed outside.

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WINNIPEG

Make Your Flowers Last Longer

If you take the time to grow beautiful flowers and arrange them — then you certainly want them to last. But there are a great many folk tales on how to preserve cut flowers. Take this True-False test. Not all of these are true, and some will do more harm than good. How good are you? Put a T in front of each true statement and an F in front of each false one. If you get 10 right, you qualify as an expert.

1. Cut flowers last longer if cut in early morning, before the sun gets hot.

2. Aspirin dissolved in vase of cut flowers will make the flowers last longer.

3. Cutting flowers with sharp knife or scissors is better than breaking off stem.

4. All flower stem ends should be burned at the tip to make them last a really long time in the vase.

5. Dahlias should be put in ice-cold water up to the blossom a couple of hours before arranging a couple.

6. Cutting stems of flowers under water will make them last longer.

7. All cut flowers should be kept in a refrigerator if possible.

8. Best room conditions for preserving cut flowers are 40° to 50° F and high humidity.

9. Drafts in room or moving air from fan preserves cut flowers because it keeps them cool.

10. Most flowers "after being conditioned" will last as long in 2 in. of water as in 12 in.

11. All underwater leaves should be peeled from stems when making arrangements.

12. To preserve cut lilacs, crush bottom 2 in. of cut end with hammer.

13. Garden lilies should have stamens removed when brought into home.

ANSWERS ON NEXT PAGE

GIVE YOUR LAWN A CHANCE TO GROW

A lawn that is scalped every week just can't look its best. You don't prune trees by cutting off all the leaves, do you? No, you let most of the branches remain to enable the tree to continue growing. Mowing really is nothing but **pruning** — just remember that fact and your lawn will benefit.

There are 3 types of **Cracking in Tomatoes**: radial (from stem end toward blossom end); concentric (around the stem end); and bursting (usually after a rain when fruits are nearly mature).

Cracking is caused by uneven growth rates, influenced by many factors such as water supply, ripeness, and heredity. Mulching and irrigating help reduce cracking. Pruning and staking cause more cracked fruits, because there is less foliage to protect them. Growers usually pick before full maturity to cut down losses. Some newer varieties tend to crack less than older ones.



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Answers to True-False Quiz on Cut Flowers

(Questions are on preceding page.)

1. *True.* Evaporation from flowers is low during the night.

2. *False.* Sterile water would preserve flower but aspirin, listerine, etc. are not strong enough to keep the water sterile. So it is better to use a preparation to retard life cycle in flower. A good formula is: $\frac{1}{4}$ t. (teaspoon) alum, $\frac{1}{4}$ t. Clorox; $\frac{1}{16}$ t. ferric oxide, 2 t. sugar to 1 qt. water; or you can get a commercial preparation such as Floralife or Bloomlife.

3. *True.* The tubular tunnels in stems that take water to the flower may become clogged when the stem is broken.

4. *False.* Only flowers with sap that will leak out (like poinsettias or poppies) get this treatment. It seals in the sap and sets it.

5. *True.* Dahlias have sap in the stem that will set if given the ice-water treatment.

6. *False.* Air bubbles do not materially clog water passageways in stems.

7. *False.* The two factors in ruining cut flowers are dry air and hot temperature. Air in the normal refrigerator is too dry. Wrap flowers in airtight Cellophane and sprinkle with water if putting them under refrigeration.

8. *True.*

9. *False.* Moving air causes too much evaporation from flowers.

10. *True.* To condition flowers, use formula given in No. 2 above and keep them in deep solution overnight. After that, cut stems on slant. See that 1 to 2 in. is covered with water.

11. *True.* They deteriorate in water and shorten life of flower.

12. *True.* Woody-stemmed branches can absorb more water if end is crushed.

13. *True.* Yellow pollen will stain white lily petals — also any table linen it falls on.

Most Common Mistake: Working Soil Too Wet

Most common garden mistake is working soil too wet. This destroys the soil structure, hinders bacterial action, cuts down on your yields.

Simple test for when it's OK to work: Dig up a spadeful of soil. Squeeze a handful. If it compacts into a tight hard mass, almost like a mud ball, it's too wet to work. Stay out of the garden. Don't even tramp around in it. If soil will mold together when you squeeze it, yet crumble readily when you pull it apart, it's workable.

Most annuals and perennials can be encouraged to keep blooming if you keep picking off the faded flowers before the seeds start to form. Flower heads of Phlox especially, should be removed since the plants set seed which comes up quite often in the monotonous magenta color.

THE WENHAM NURSERY

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Perennial Flowers

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PEONIES — BLEEDING HEART — PHLOX — APPLES — PLUMS
CRABAPPLES — CHERRIES — RASPBERRIES — STRAWBERRIES
CEDAR — BLUE SPRUCE — ROSE BUSHES — MUGO PINE
SOD — LAWN DRESSING — ROCKERY PLANTS

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Lawns

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A good lawn is a prime feature in the development and improvement of the home grounds. It is the chief part of the foreground and the base of every landscape planting. It provides the setting for flowers, trees, and shrubs and enhances the beauty of the home.

The New Lawn

A good lawn needs good soil. At least six inches of good topsoil are needed to grow good grass. If you are building a new home, make sure your contractor saves your topsoil. Have him push it into a separate pile on one side. It will save you money when you make your seed bed. Don't seed your lawn on basement subsoil. It will give you indifferent results. The lawn, like the home, is no stronger than its foundation.

Filling in should be done as soon as possible, even if roughly, so it can settle. Find location of sewer holes and saturate with water several times. Have filling as level as possible, before spreading top soil. Make your level approximately two inches higher than sidewalks. Grade away from the house; a fall of about one inch to twelve feet is about right. Let the seedbed settle as long as possible before seeding. Rolling and raking will help. If water is available, repeated soaking will speed up settling. If the area is not evenly packed small depressions will appear, water will settle in these areas and eventually kill the grass.

Before seeding destroy as many weeds as possible. A little delay will allow many of the weed seeds to germinate. Several thorough cultivations will then destroy most of the annual weeds. Any creeping perennials will have to be dug out by hand.

The best time to seed is between August 15 and September 15 as this is the dormant season for weeds and cool moist nights and warm soil develop strong roots. If you wish to seed in the spring, do so before June 10 (earlier if no water) so that the grass will have germinated before the hot weather. If watering is a problem, seeding in late fall is a good time. Cover the area with brush to hold the snow and leave the brush on, until the grass has germinated the following spring.

Before seeding work an application of complete plant food into the soil, a day or so before seeding. Seed one pound to two hundred square feet of lawn. 50% Kentucky Blue, 50% Red Top is a good mixture. For shade and drier areas replace 20% of Red Top with Crested Wheat Grass. Where water is

available, 100% Kentucky Blue Grass makes the best lawn. It, however, is slower to germinate, takes more care, and is longer in becoming established. Divide your grass seed into two equal parts, and make a double seeding — going from East to West and then North to South. Push rake back and forth. Roll again. Dress with good top soil or rotted screened manure one quarter inch thick or a little less. Make sure this top dressing is free of weeds. Water well with a fine spray and keep moist until grass is germinated.

If sod is used, a foundation of at least two to three inches of top soil is desirable. After the sod is laid, pound well, sprinkle a little seed, and top dress lightly. Soak area well. Sodding should be finished by September 15.

Maintenance of Established Lawns

Some of the causes of deterioration of old lawns are:

1. Soil in poor physical condition, due to not being properly prepared when lawn was originally made.
2. Poor drainage or settling.
3. Improper maintenance, such as infrequent cutting, failure to provide plant food, too close cutting in hot and very cold seasons, failure to reseed bare spots from time to time, too hard raking at spring clean-up, and failure to roll when necessary.
4. Presence of trees with roots near the surface, which take all the moisture and nourishment from the grass.
5. Too many trees branching low, causing heavy shade.
6. Invasion of perennial weeds.
7. Undermining by pests such as ants.
8. Too rough and constant hard use, such as use of area for play by children and pets.

The answer to 1 and 2 could be dig it up and start over again. But that is more easily said than done. It further takes time, money and a strong back so let's take a more temperate approach.

Do you realize that in a normal year grass makes the amazing growth of over thirty inches? No soil can continue to sustain such growth, without replenishment of the food supply.

So starting with spring:

1. Feed your lawn early (before growth starts) with a complete plant food. It will go to work immediately, revitalizing your old grass and allowing it to re-establish itself early and well. Sowing fresh seed can be a waste of money and effort unless the soil is first fed.

A fertile soil will effectively fill in a thin turf, as well as support a heavy growth of lawn grass.

2. When your lawn has dried out, rake it, but not too hard. You will only lift the grass that has heaved. Spring rolling is beneficial, but be sure the lawn is not too moist.
3. By early May you can detect the open spots on your lawn. Dig them up with a fork, level out any depressions, make a good seed bed and plant fresh seed, cover lightly, tramp down the seed area, and keep moist until after germination. Spreading grass seed on top of an established lawn by the "feed the chickens method" is a waste of time and money. You must prepare a seed bed to get effective results.
4. As soon as any weeds appear, give your lawn a good spraying with liquid 2, 4-D making sure to keep it away from shrubs and plants.
5. When it is time to cut your grass do not cut it too short. Set your mower $1\frac{1}{4}$ " to $1\frac{1}{2}$ " high, while in warm weather get it up to 2". Unless your lawn gets too long before cutting, leave the clippings on. They act as a mulch, as well as supplying humus to the soil.
6. If your lawn becomes infested with ants, or other soil insects, a treatment with Chlordane will effectively eliminate these pests.
7. A further feeding of complete plant food in late August or early September is also beneficial.

Follow these steps and be proud of your lawn — and your home.

1955 FLOWER, FRUIT AND VEGETABLE

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GREATER WINNIPEG HORTICULTURAL SOCIETIES

West Kildonan — Aug. 17, 18

Charleswood — Aug. 19, 20

Fort Garry — Aug. 18, 19

Winnipeg — Aug. 24, 25

St. Vital — Aug. 18, 19, 20

St. James — Aug. 25, 26

The Provincial Fruit and Honey Show will be held in conjunction with the Winnipeg Horticultural Society Show on August 24th, 25th, in the Civic-Caledonian Rink, Winnipeg.

Index to Advertisers

	Page		Page
Aaron Fur Co., 334 Portage Ave.	10	Manitoba Clothing Co. Ltd., 550 Main St.	108
Avenue Drug Store, Portage at Valour Rd. ...	74	Mestery's Radio & Electronic Service, 188 Sherbrook St.	54
Aqua-Terra Pet and Sporting Good Store, 518 Portage Avenue	108	Melady, Sellers Securities & Grain Corp., 919 Grain Exchange	8
Ballerina Flower Shop, 1314 Main St.	108	McLean, Chas. Electric, 811 Portage Ave.	128
Biggar Bros. Freight Lines, 425 Gertrude Ave. 108		Modern Dairies Ltd., St. Joseph at La Verendrye	128
Bardal, A. S. Ltd. Funeral Home, 843 Sherbrook St.	46	Miller Hatcheries, 262 Main St.	80
Burns & Co. Ltd., 1010 Logan Ave.	90-91	North End Furniture Co. Ltd., 843 Main St. ..	64
Blackwoods Beverages Ltd., 341 William Ave. ..	20	Orchid Florists, 310 Donald St.	64
Brigdens of Winnipeg Ltd., Notre Dame at Langside	16	Orniston, R. B. Ltd., 96 Osborne St.	86
Broadway Florists, 277 Portage Ave.	98	Paulin Chambers Co. Ltd., 311 Ross Ave.	67
Broadway Meat Market, 576 Broadway Ave.	108	Peerless Laundry & Cleaners Ltd., 55 Pearl St. 20	
Canadian Publishers Ltd., 619 McDermot Ave. 68		Perth's Cleaners, Launderers & Furriers, 482-6 Portage Ave.	86
Capitol Theatre	86	Pound, F. C. "Drive-In Flower Shop", 1012 Mulvey Ave.	58
Cropp's Reliable Seeds, 221 Market Ave.	64	Powell, K. Q. (Canada) Ltd., 563 Grain Exchange	112
Calhoun's Ltd., 237 Portage Ave.	74	Patmore Nurseries Ltd., Brandon, Man.	16
Chipman Chemicals Ltd., 1040 Lynn Ave.	10	Prairie Nurseries Ltd., Estevan, Sask.	24
City Hydro, 55 Princess St.	60	Quinton's Ltd., Jessie and Daly St.	106
Connery, D., St. Germain P.O., Man.	50	Red River Motor Coach Lines, Ltd., 336 William Ave.	112
Corona Hotel, Notre Dame E.	46	Russell Motors Ltd., 730 Portage Ave.	98
Ditchfield & Son, McGillivray Blvd., Fort Garry 94		Rusco Windows Manitoba, 1530 Erin St.	32
Dolgin Jewellers, 468 Portage Ave.	20	Sally's Ltd., 243 Portage Ave.	46
Dustbane Western Ltd., 349 Elgin Ave.	16	Scott Bathgate Ltd., 149 Notre Dame E.	80
Drewry's Ltd., Redwood and Main St.	118	Sargent Florists, 739 Sargent Ave.	20
Dixon-Reid Co. Ltd., 442 Spadina Ave., Toronto 117		Seymour Hotel, 277 Market Ave.	54
Eaton's Co. Ltd., Portage and Donald Outside Back Cover		Shea's Winnipeg Brewery Ltd., 137 Colony St. 42	
Elmwood Cemetery Co. Ltd., 132 Kelvin St. ...	121	Shelmerdine Nursery, 3612 Roblin Blvd., Charleswood, Man.	53
Electrolux (Canada) Ltd., 235 Fort St.	42	Salisbury House Ltd., 641 Broadway Ave.	117
Florists Supply Co. Ltd., 696 McGee St.	97	St. Vital Agricultural Society	24
Fort Rouge Decorating and Sand Blasting Co., 255 Osborne St.	34	Steele Briggs Seeds Ltd., 139 Market St. E. ..	128
From, J. H., 902 Logan Ave.	41	Success Commercial College Ltd., Portage at Edmonton	112
Glenorchie Nursery, Red River, Old Kildonan	63	Swifts Canadian Co. Ltd. Inside Back Cover	
Gardenia Florists, 875 Portage Ave.	32	Toronto Fur Co. Ltd., 391 Portage Ave.	54
Hobb's A. & J. Ltd., 403 Graham Ave.	100	T & T Seeds & Chemicals Ltd., 630 Lorette Ave.	2
Holland Bulb Gardens, 40 Oakmount Rd., Toronto	46	Thomson Chapels, 669 Broadway Ave.	84
Honeywood Nursery, Parkside, Sask.	80	Thiessen Transportation Ltd., 322 Kennedy St. 68	
Ibbott & Leonard Jewelry Mfg., 401 Donald Blk., Donald St.	10	Vendome Hotel, 308 Fort St.	34
Jenkins, T. B., 645 Cambridge St.	54	Venus Venetian Blind Co. Ltd., 61 Sherbrook St. Inside Front Cover	
King's Ltd., 396 Portage Ave.	124	Wallace Nurseries Ltd., Portage la Prairie, Man. 105	
Kresge, S. S. & Co. Ltd., 368 Portage Ave. ...	10	Wenham Nursery, Lot 58, St. Mary's Rd.	128
Lush-Burke Electric Ltd., 611 Ellice Ave.	64	Winnipeg Laundry Ltd., 969 Sherbrook St. ...	118
Luke's Electric Motors & Machinery Co. Ltd., 324 Notre Dame Ave.	34	Winnipeg Board of Parks & Recreation, Exchange Bldg., Princess St.	6
Manitoba Telephone System, 166 Portage Ave. E.	60	Winnipeg Piano Co. Ltd., 383 Portage Ave. ...	74
Manitoba Sausage Mfg. Co. Ltd., 691 Dufferin Ave.	32	Windsor Hotel, 187 Garry St.	74
Manitoba Auto Spring Works, 175 Fort St.	34	Yetman Machine Works, 875 Notre Dame E. ..	82
Mallon Optical, 405 Graham Ave.	98		

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